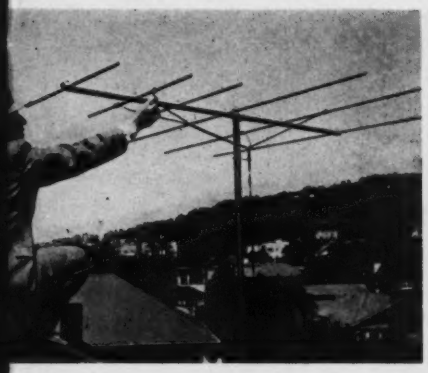
ELECTRICAL WEST

May 1953
25 Cents

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U.S.



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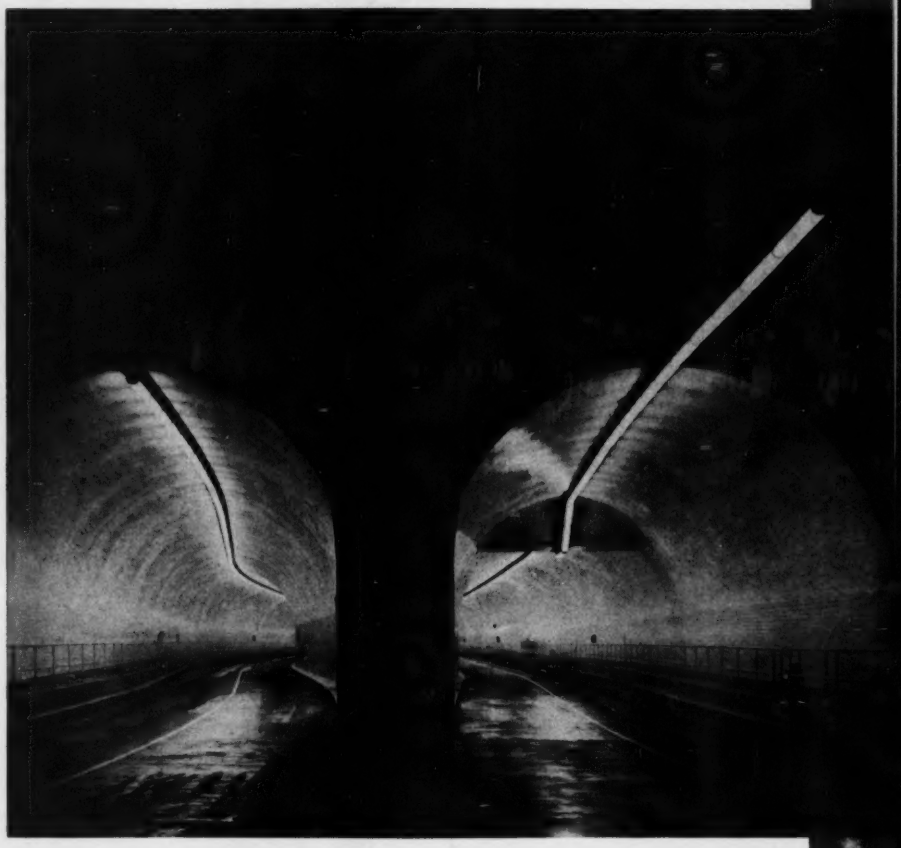

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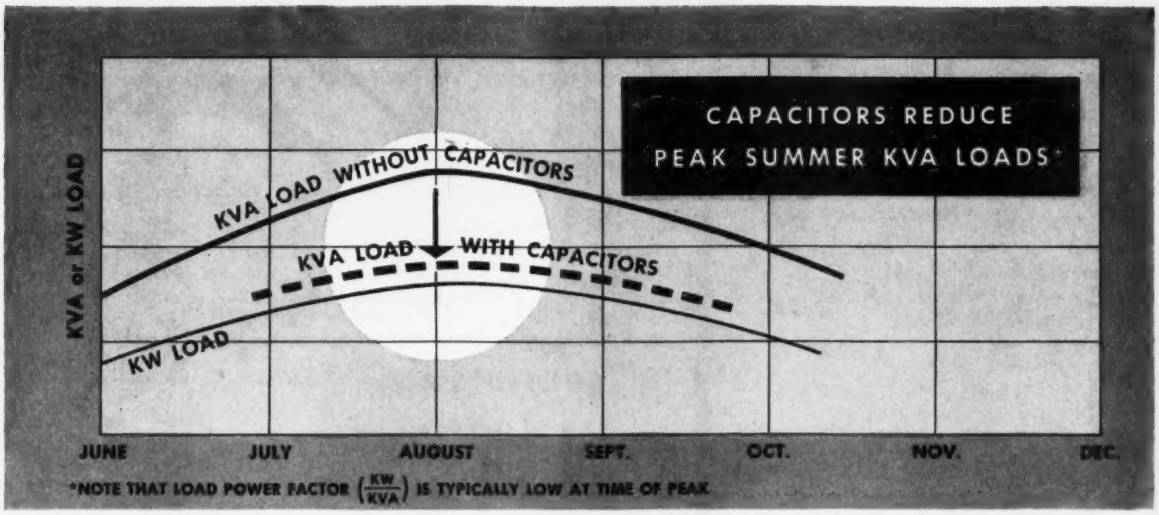
silent part-ner!

Confidence is an extremely important factor in every appliance sale. And customers know, by and large, that the label of a qualified manufacturer and the sign of a reputable dealer are assurances of a quality product.

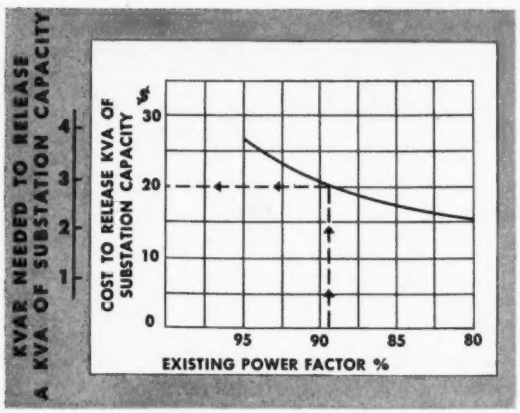
There's another confidence in the picture, too. It is the assurance that once the appliance is installed, a dependable and adquate supply of electricity will power its performance. That fact doesn't need a a sign or a label.

In Central and Southern California Edison Service has been a part of every appliance sale for well over half a century—and a part played so efficiently that customers know it goes without saying!

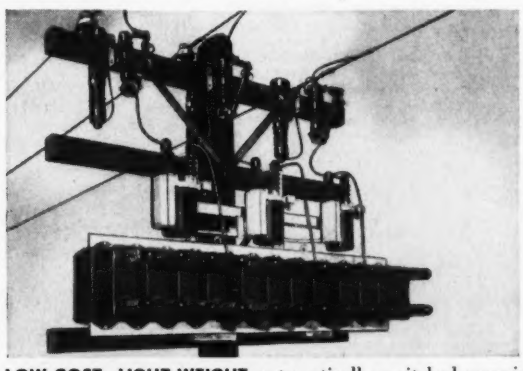
Edison SOUTHERN CALIFORNIA EDISON COMPANY



Utilities report: G-E capacitors solve summer load problems economically



WHAT IT WILL COST YOU to lower your peak summer load with capacitors. At 89% power factor, a KVA of capacity can be released with about 3 KVAR of capacitors costing $20.



LOW-COST, LIGHT-WEIGHT automatically switched capacitors are available for use on distribution circuits. This 300-kvar G-E equipment costs less than $6 per kvar.

Relieve overloaded equipment—release a KVA of system capacity for only $15 to $25

During summer months, low-power-factor air-conditioning loads create a serious problem for utilities—particularly those in warmer climates. The high kilovar content of these loads overloads transformers, causes excessive voltage drop and high power losses.

CAPACITORS—THE PRACTICAL SOLUTION

Capacitors are widely accepted as the economical solution to this problem. Installed in fixed and switched banks on distribution substation busses or outlying distribution poles, capacitors reduce KVA loading of substations and overhead lines. And the switched capacitors can help regulate voltage —keep voltage up right out to the ends of feeders.

BENEFITS FROM CAPACITORS

1. Capacitors allow two to three times more load to be carried on voltage-limited circuits.

2. Capacitors release thermal capacity—permit substations to carry more kilowatts.

3. Capacitors often pay for themselves out of savings resulting from reduced system losses.

IF YOU HAVE A SEASONAL LOAD PROBLEM

If you have a seasonal load problem, it will pay you to investigate General Electric switched capacitors. For full information, get in touch with your nearest G-E representative or write General Electric Company, Section 441-4, Schenectady 5, New York.

1878 75 1953 YEARS OF ELECTRICAL PROGRESS

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

MAY 1953

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S. The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal," "Journal of Electricity, Power and Gas" and "Journal of Electricity." Contents copyright. Sixty-fifth year of publication

VOL. 110 NO. 5

ELECTRICAL WEST

George C. Tenney, Editor
W. A. Cyr, Associate Editor — Walter C. Heston, Engineering Editor
Peggy Boyer, Associate Editor — John Coetz, Typography

NEXT MONTH

June is the annual Convention-in-Print issue. For this "convention" Electrical West picks prominent "speakers" from the various sections of the Far West who discuss timely electrical industry topics. An outstanding "program" has been arranged again this year. J. J. Duel, California Farm Federation, will discuss California ownership of the Central Valley Project.

Our responsibility for future engineering leaders is the timely subject chosen by H. N. Muller, assistant to the vice-president, Westinghouse Electric Corp.

E. Robert de Luccia, vice-president, Pacific Power & Light Co., will give his observations and comments on federal power practices.

A four-part symposium on technological horizons in engineering and operation will be of special interest to executives. The field of generation will be handled by W. L. Chadwick, vice-president, Southern California Edison Co.; transmission by J. F. Sinnott, San Diego Gas & Electric Co.; distribution by T. A. Phillips, Arizona Public Service Co.; and communications by R. H. Miller, Pacific Gas and Electric Co.

There will be a message for the electrical contractor by a "speaker" not yet selected and to round out a big issue there will be the annual reviews by the presidents of three electrical associations in the West.

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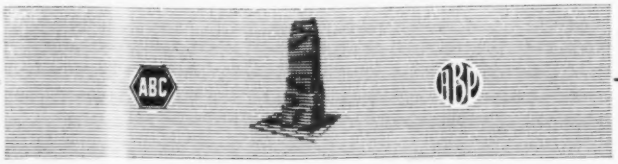

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L-M's EEI Specification 15" and 18" Pole Top Pins Ribbed for Extra Strength

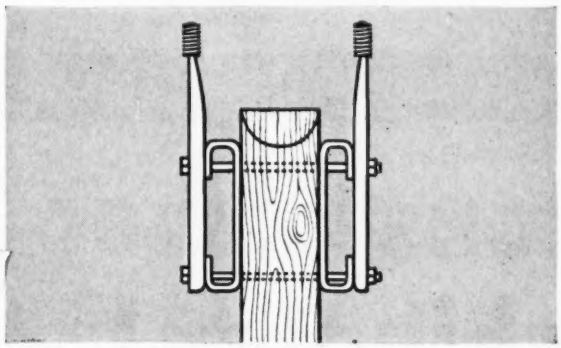
L-M's Pole Top Pins redesigned for extra strength. Ribs in the sides of channel section provide additional resistance to deflection. Meet EEI and REA specifications.

Formed ribs in the sides of the heavy channel steel of L-M pole top pins provide extra strength without adding unnecessary weight.

The pins are available in 15- and 18-inch lengths. The 15-inch pin has 5-inch hole spacing; the 18-inch pin has both 5-inch and 8-inch spacing.

Both pins amply meet the specification of 1500 pounds in transverse loading and 1200 pounds in longitudinal loading. Both are heavy 8-gauge channel steel, hot-dip galvanized.

Meet REA Specifications



The 15- and 18-inch pins meet REA specifications. Also available is L-M's REA-specification 20-inch 1⅜" lead head pole top pin and bracket.

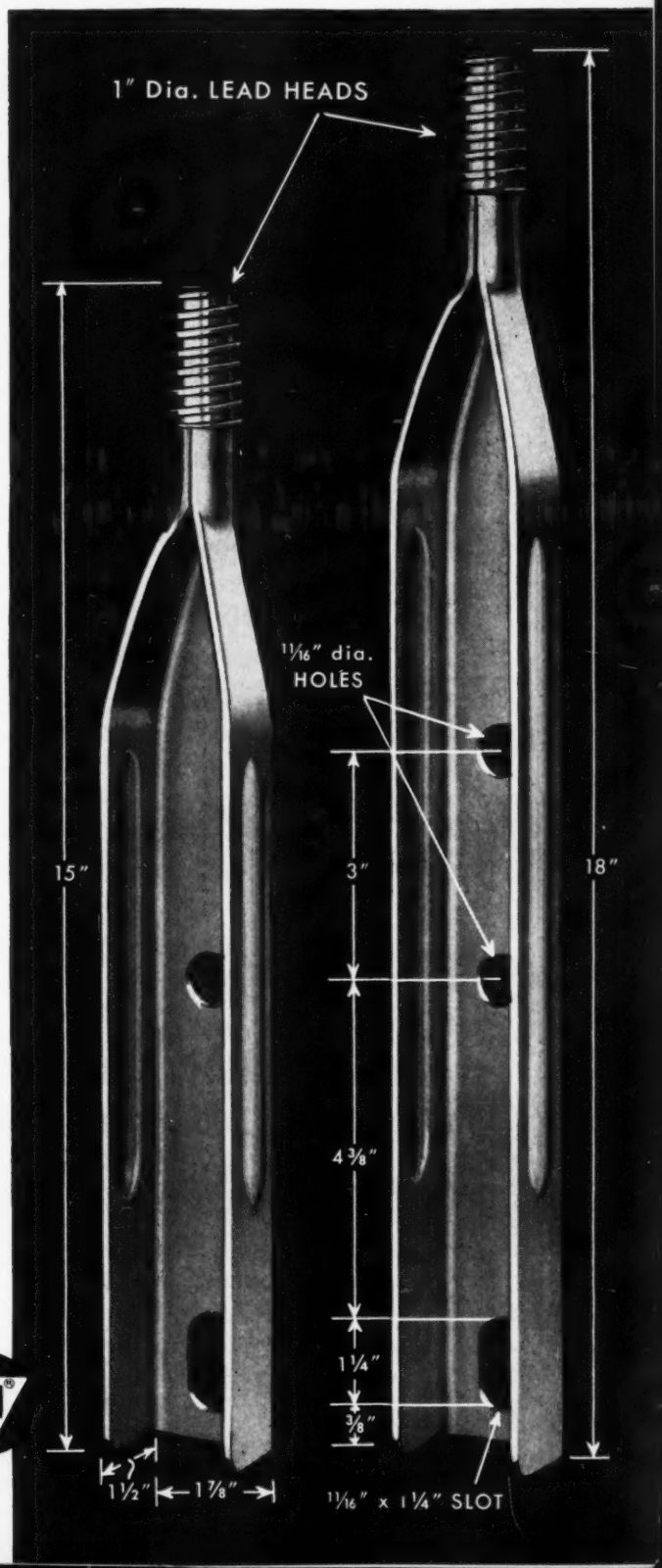
Get Information and Samples

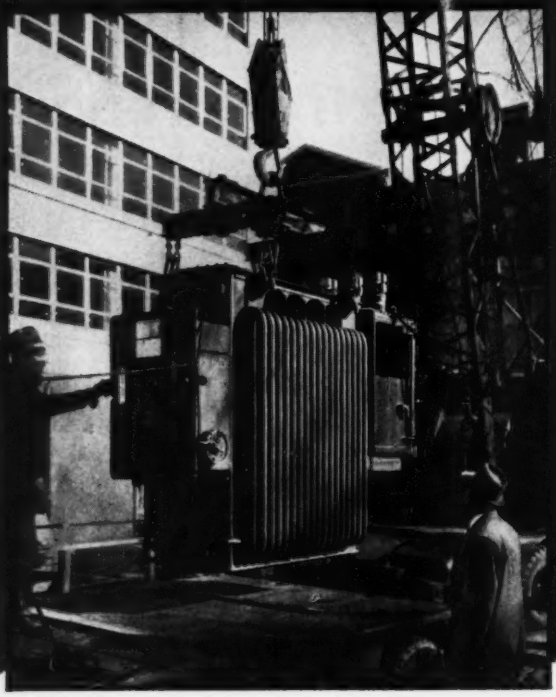
L-M offers a wide variety of Line Construction Materials and specialties to meet almost any problem. These items are stocked in L-M's 40 warehouses all over the country. Ask the L-M Field Engineer for information and samples. Or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division). 115

LINE MATERIAL

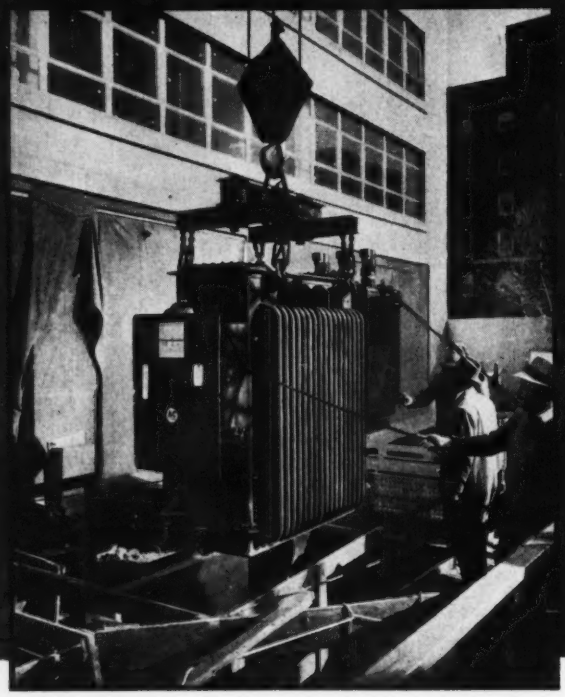
Line Construction Materials

BE CAREFUL. THE LIFE YOU SAVE MAY BE YOUR OWN.





1 **New Network Transformer Installation** provides principal power supply for new office building. Pictures show transformer being moved to site and being installed.



2 **This 750-kva Network Transformer** will supply all electrical service except for air conditioning motors. Location is at junction of Connecticut Avenue and "K" Street, 4 blocks from White House.

A Network Transformer Goes to Washington!

ALLIS-CHALMERS TRANSFORMERS USED ON POTOMAC ELECTRIC'S SYSTEM

Allis-Chalmers is proud to help serve on the fine network system of the Potomac Electric Power Company. Having had 15 years' experience with Allis-Chalmers network transformers, this utility has found them to give highly efficient performance.

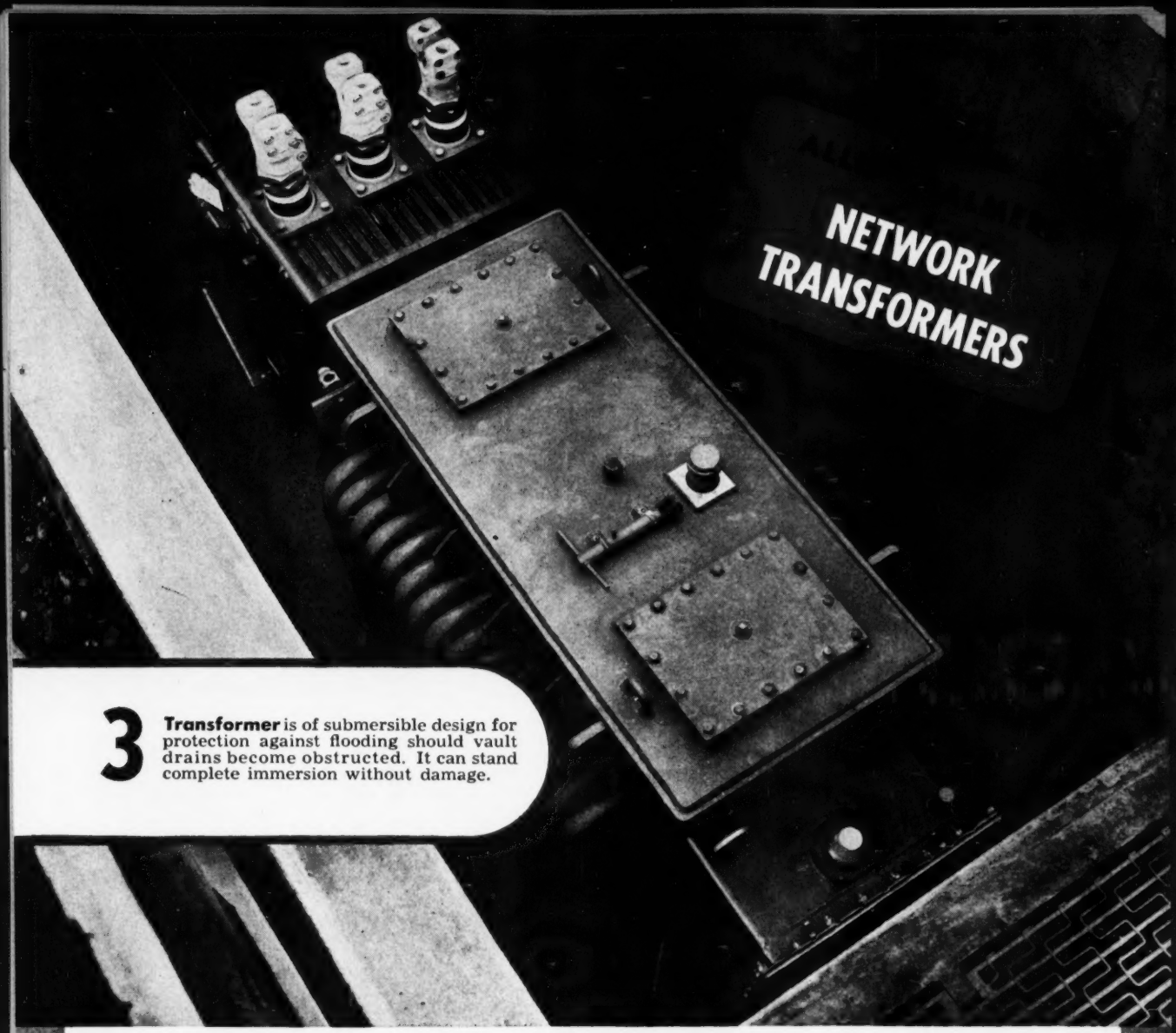
Excellence in construction detail is a major reason why Allis-Chalmers network transformers are chosen by so many utilities. Over 1¼ million kva of these units are now serving the nation's most important systems. Compact, low-loss design and high thermal capacity of Allis-Chalmers network transformers meet the severest load conditions.

See your nearest A-C district office for more details or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4010

ALLIS-CHALMERS

A-C ALLIS-CHALMERS



3 **Transformer** is of submersible design for protection against flooding should vault drains become obstructed. It can stand complete immersion without damage.

Here are Reasons Why the System Will Benefit

Spiral Wound Gaskets Are Performance Proved

In over 5 years of continuous use, spiral wound gaskets have proved their superiority over other types of gasket material for sealing bushings in the tank wall.

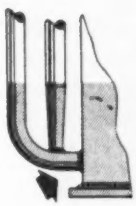
Alternate plies of preformed spring-like metal and non-metallic fillers provide unusual resilience that actually adjusts itself to changes in operating conditions. This gasket, installed without the use of cements or grease, simplifies the removal of bushings if required. The gasket may be re-used if necessary.

Weld-Seal Construction Eliminates Major Gaskets

The main cover and switch compartment are welded to the tank to eliminate leaks. Oil sludging and oxidation of insulation is minimized.

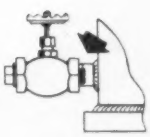
Special Surface Treatment Provided

Areas that may be exposed to severe corrosive conditions are thoroughly protected. Tank surfaces are grit-cleaned and given three coats of baked-on phenolic paint (formulated for moisture resistance). A special bituminous compound gives added protection to surfaces and tubes in base areas.



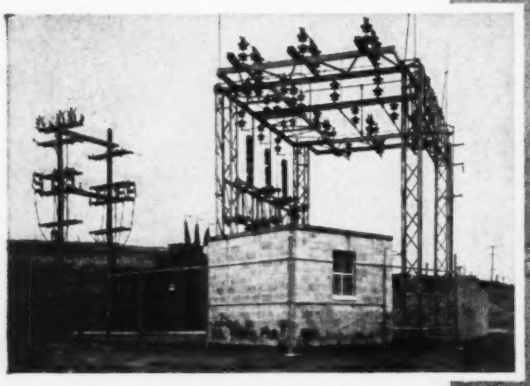
Threaded Valve Connections Are Solder-Wiped

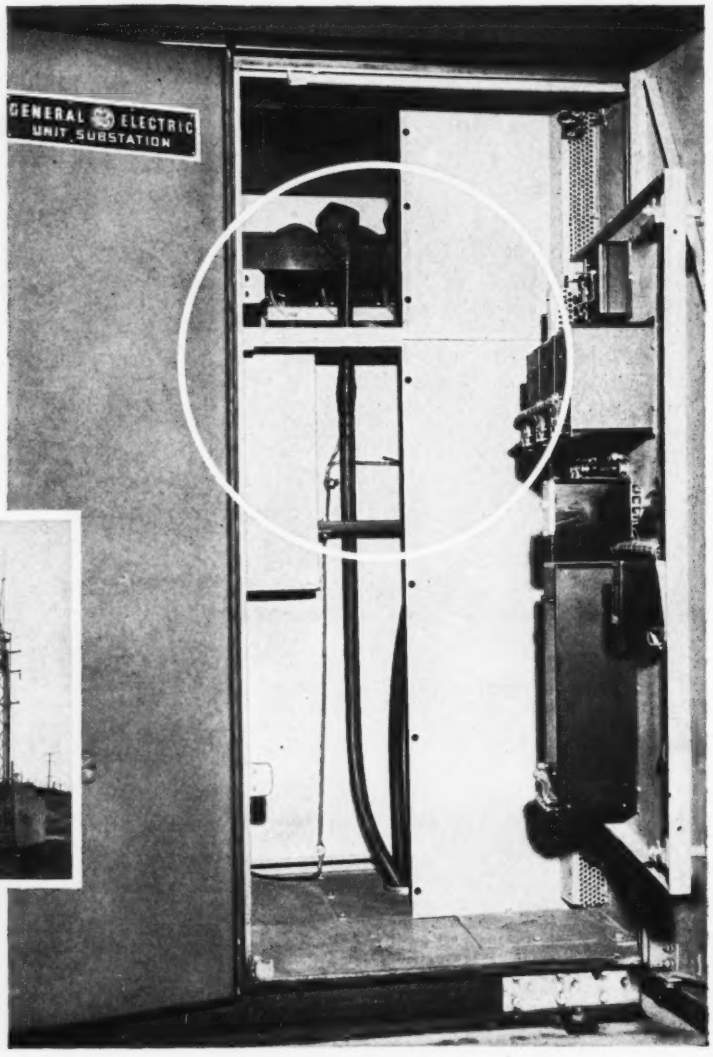
Threaded valve connections are solder-wiped for extra protection. Valves are located for maximum accessibility. Globe type valves with non-rotating seats close tight, avoiding wear on valve seats.



YOU DON'T NEED POTHEADS

. . . when you use G-E Super Coronol cable





Above, substation of eastern electric utility incorporating G-E Super Coronol cable and G-E unit substation. At right, interior view of the G-E unit substation showing how the G-E Super Coronol cables used for "get-aways" are terminated without potheads.

Take advantage of this way to lower cable installation costs

A growing use of General Electric's Super Coronol* cable is as "get-away" cable in connection with packaged substations. Simplified termination, with no potheads, is one of the reasons.

The new, higher-temperature rating for Super Coronol cable which permits 85 C copper temperature for 0-8000 volts is important, too. This increase in rating has been made after five years of continuous testing under load at temperatures as high as 121 C. For 8001-15000 volts Super Coronol cable is rated at 80 C copper temperature.

Ozone-resisting Super Coronol cable, with its neoprene-base jacket, gives exceptional service wherever high voltage rubber-type cable can be used—for ducts or conduit, aerial service, direct burial, submarine, or generator leads, etc.

Your G-E Wire and Cable specialist can give you more information about Super Coronol cable. Or, write Section **W58-525,** Construction Materials Division, General Electric Company, Bridgeport 2, Connecticut.

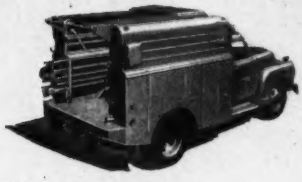
*Registered Trade-mark General Electric Company

1878 75 1953 YEARS OF ELECTRICAL PROGRESS

You can put your confidence in—

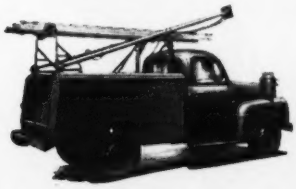
GENERAL ELECTRIC

UTILITY WORKHORSE-



LINE CONSTRUCTION BODY (500)
Medium and heavy duty work. Vertical compartments are optional . . . can be equipped to fit individual needs.

REVOLVING AERIAL LADDER
Models available in working heights of 23' 6", 26' 6", 30' 6", and 32' 6" for all styles of bodies.



LIGHT DUTY MAINTENANCE BODY (350)
Fold-over type derrick will handle poles up to 40' in length. 24' ladder extends from rear of body.

HYDRAULIC TOWER
Available in sizes from 21' to 30'. Platform revolves full 360°. Tower can be operated from cab or platform.

FOR LONG LIFE AND TROUBLE FREE SERVICE

All *Powers-American* bodies have *earned* the reputation of "workhorse" of the utility industry by years of faithful performance. No matter how tough the job or the operating conditions, they pull more than their share of the load by stepping up crew efficiency and lowering operating costs. Whatever your utility body needs, *Powers-American* is your *1* source for *all types* of utility bodies and equipment. Write today for more information. Put a *Powers-American* "workhorse" on your job and watch the team pull ahead!

"The Accepted Standard with Utilities Everywhere"

LINE CONSTRUCTION BODY (600)
Completely equipped to carry all tools and materials needed for line work. Can be furnished with winch and derrick, compressor, digger, or any special equipment required . . . for use in any phase of the utility industry. Available in 9' to 14' lengths, with or without built-in crew compartment.

There are many styles of *Powers-American* Bodies not shown here. Write for descriptive catalog today.

POWERS *American* DIVISION

PUBLIC UTILITY BODIES AND EQUIPMENT

McCABE-POWERS AUTO BODY COMPANY

HOME OFFICE: 5900 North Broadway, St. Louis 15, Mo.

WESTERN OFFICE: 4565 Eastmont Square Blvd., Oakland 15, Calif.

For many years Contractors from Coast to Coast have used Briegel All Steel Indenter Fittings. U. L. approved as concretetight and for general use, B-M Indenter Fittings are faster, easier to use and neater in appearance.

Installation is simple and less expensive. Two quick squeezes sets them forever. Try B-M Indenter Fittings and get more profits from each job!

BRIEGEL METHOD TOOL CO.
GALVA, • ILLINOIS

Distributed by

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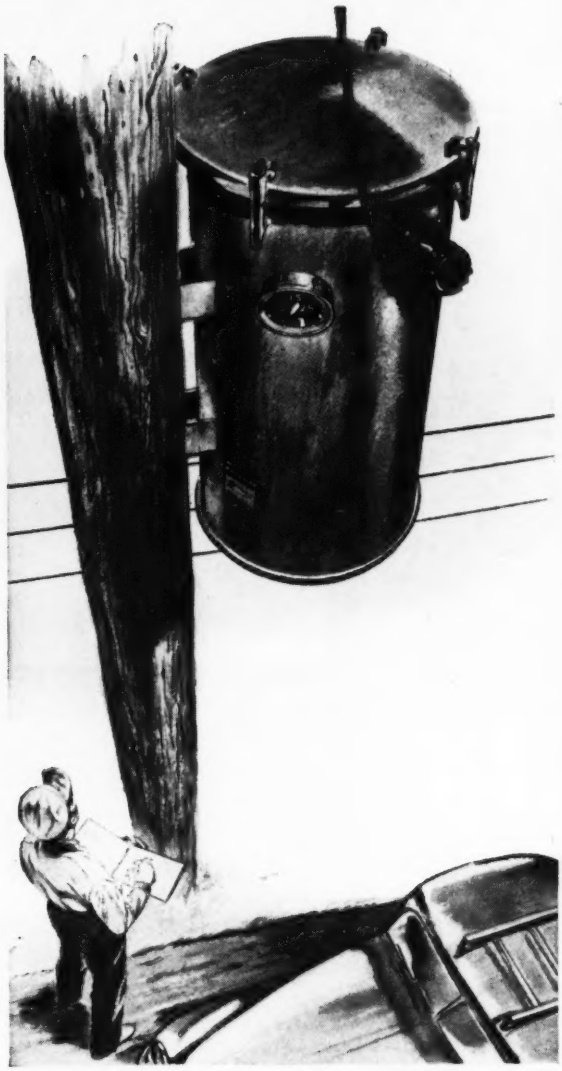


Better load records . . . lower cost! Safer and easier, too. No need to climb for ammeter checks. No guessing about overloads. Dial can be read from the ground.

New overload indicator takes "guess" and "work" out of load surveys

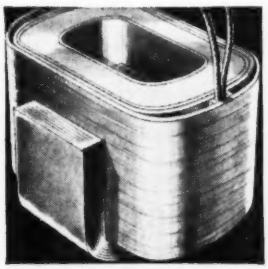
It flashes a warning . . . *and counts overloads, too!*

The new Westinghouse Type "PL" Overload Indicator eliminates load-check climbing, puts an end to guesswork about overloads, and does it more accurately than any comparable device.

The red light tells that the transformer is now or has been overloaded. The dial completes the story, telling *how many times.* Since the indicator is operated by a thermostat embedded in the coil, indication is highly accurate because it is a direct reaction to copper temperature.

On each of the first four overloads, whether they're hours, days or months apart, the warning signal lights. It then goes out automatically as the overload passes, but the dial shows the number experienced. On the fifth overload, the signal light locks on as a continuous warning of the serious condition. The dial records consecutive overloads up to 28...far more than should occur before change-out. A pushbutton is provided at the base of the dial to clear the indicator for a new load-checking cycle.

Developed as the result of years of co-operation with utilities to determine the most useful type of overload indication, the Westinghouse Type "PL" Indicator opens the way to more accurate load records than ever before possible . . . at a fraction of the time and expense. Available on all conventional models of Westinghouse Single-Phase Distribution Transformers, 3 through 167 kva, 15,000 volts and below. Your Westinghouse representative will be glad to give you further information, or write direct to Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pennsylvania. J-70669-A



Highest possible accuracy! The Westinghouse Type "PL" Overload Indicator is operated by a thermostat embedded in the transformer coil, where it reacts directly to copper temperature.

Warning...overworked transformer! The red light shows overload condition; the pointer indicates how many times this has happened. Reset button may be used to return the pointer to zero.

YOU CAN BE SURE...IF IT'S

Westinghouse

Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver

DROP-FORGED for GREATER STRENGTH

BTC

M.P.L. Aluminum

SUSPENSION CLAMP

for A.C.S.R.
and All-Aluminum Conductors

MINIMUM POWER LOSS

INCREASED CONDUCTOR LIFE

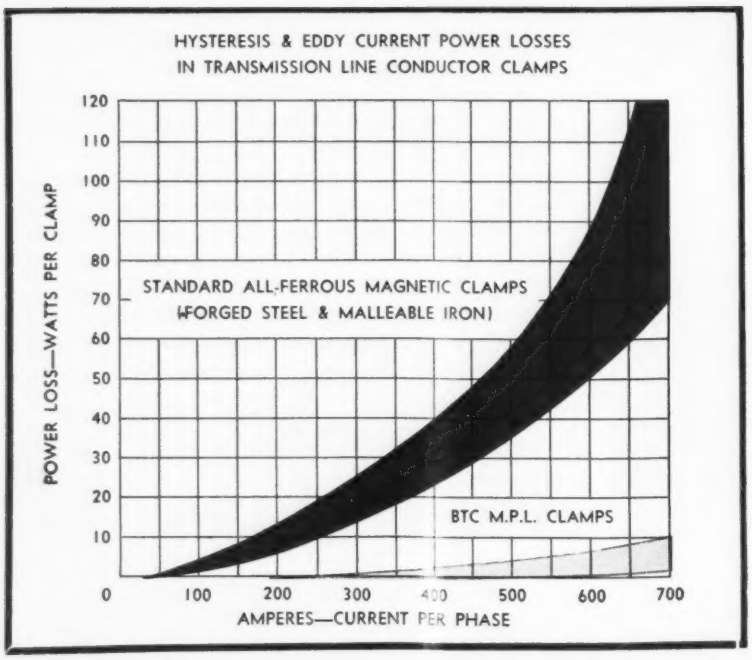
STRONGER

MPL MINIMUM POWER LOSS

The use of non-magnetic Aluminum Alloy Clamp Body reduces eddy current and hysteresis losses to a minimum . . . prevents temperature rise in the clamped section of the conductor, which will operate at lower temperature than in the span.

CONSIDERABLY STRONGER

Forgings, in any metal, are employed where better strength, soundness and finish are required than can be obtained by other processes. Forging produces a fine, close-grained structure, with the grain flow following the contour of the part and with optimum mechanical properties and ability to withstand severe loading, sudden shock and frequent reversal of stress.

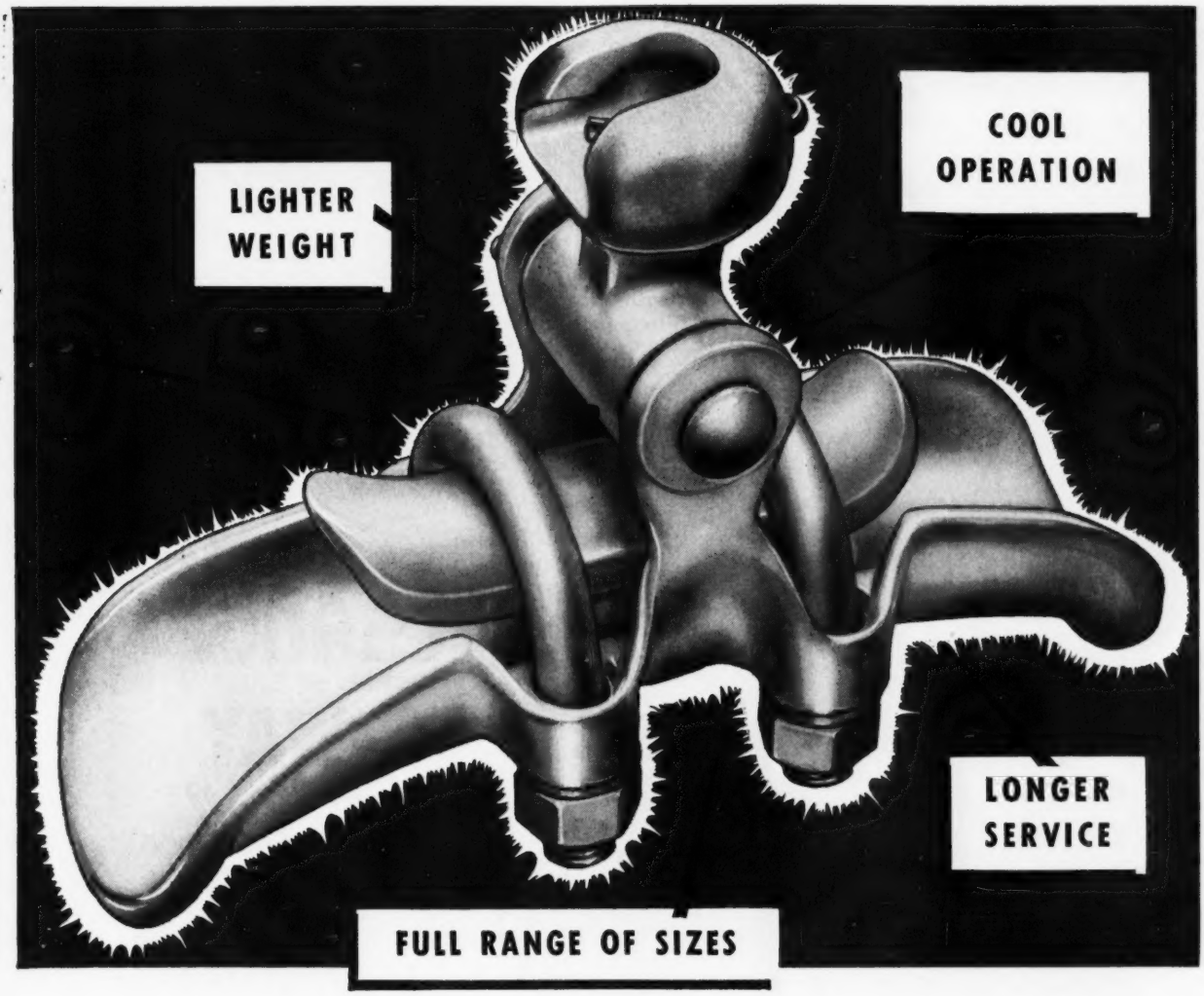


The BTC Clamp Body is FORGED Aluminum alloy, the strongest recommended for the purpose, fully heat-treated to develop maximum mechanical properties.

In the heat-treated condition, the ultimate strength and hardness is more than twice . . . and the yield strength and endurance limit more than three times . . . that of alloys used in other processes. The more-than-adequate catalouged strength ratings of BTC Clamps are conservative and are exceeded in actual tests.

LIGHTER WEIGHT

Heavy sections or reinforcing ribs, necessary in other materials to develop desired strength and prevent collapse or breakage of the clamp under clamping U-Bolt pressure, are not required in forged clamps. Undesirable weight is eliminated without sacrifice of strength.



INCREASED CONDUCTOR LIFE

The light weight and generous longitudinal radius of the conductor seat minimize the effects of conductor vibration. The conductor is not bent over a small radius at any point.

Clamping pressure is greatest at the center, gradually decreasing toward each upswept end of the keeper. Clamp and Keeper ends are liberally bell mouthed and beaded to prevent conductor damage and formation of corona.

The conductor is fully supported in the clamp body. There are no open pockets at U-Bolt holes to allow distortion of the conductor under clamping pressure.

LONGER SERVICE

The superior strength insures against failure under severe loading. The greater hardness prevents excessive wear at points in contact with the supporting pin.

The close-grained, non-porous structure of the forged clamp body effectively prevents the destructive internal seepage of corrosive elements, a cause of failure in some transmission line fittings produced by other processes.

FULL RANGE OF SIZES

BTC offers a choice of exactly the right clamp for each size of A.C. S.R. or all-aluminum conductor. The close dimensional fidelity of the die-forged and die-formed parts makes unnecessary any bore size allowance for manufacturing variations in the clamps.

Specify BTC MPL Aluminum Suspension Clamps from your insulator manufacturer. They are an important part of BTC's complete line of forged transmission line hardware.

Sold Through Your Insulator Manufacturer Only

Drop Forged BTC *Hi-Line Hardware*

***The* BREWER-TITCHENER**

Corporation

Cortland · New York

Build lines to stay with the CHANCE 8-Way

For best results, use the anchor that pushes *eight* blades into undisturbed earth all around the hole, with no wasted space between blades. This means complete, balanced load distribution.

Chance 8-way Anchors are available in a complete range of sizes from 60 to 200 square inches in area, for distribution or transmission line guying. Get full information today—consult your Chance Catalog—order from your regular supplier.

the CHANCE 8-WAY *gives full load distribution*

Anchor installations are *faster, easier* and *better* when line crews use the right tools. Chance tools are designed for efficiency and safety. The tools shown at right are what you need for expanding anchor installations.

1. Chance Combination Expanding and Tamping Bar. It hooks around the anchor rod and will not slip off.
2. Chance Telescoping Trip Auger—it bores like a bit, adjusts for various hole sizes, and has an easy dump trip.

Send for the Chance folder on the tools to use for better anchor installations.

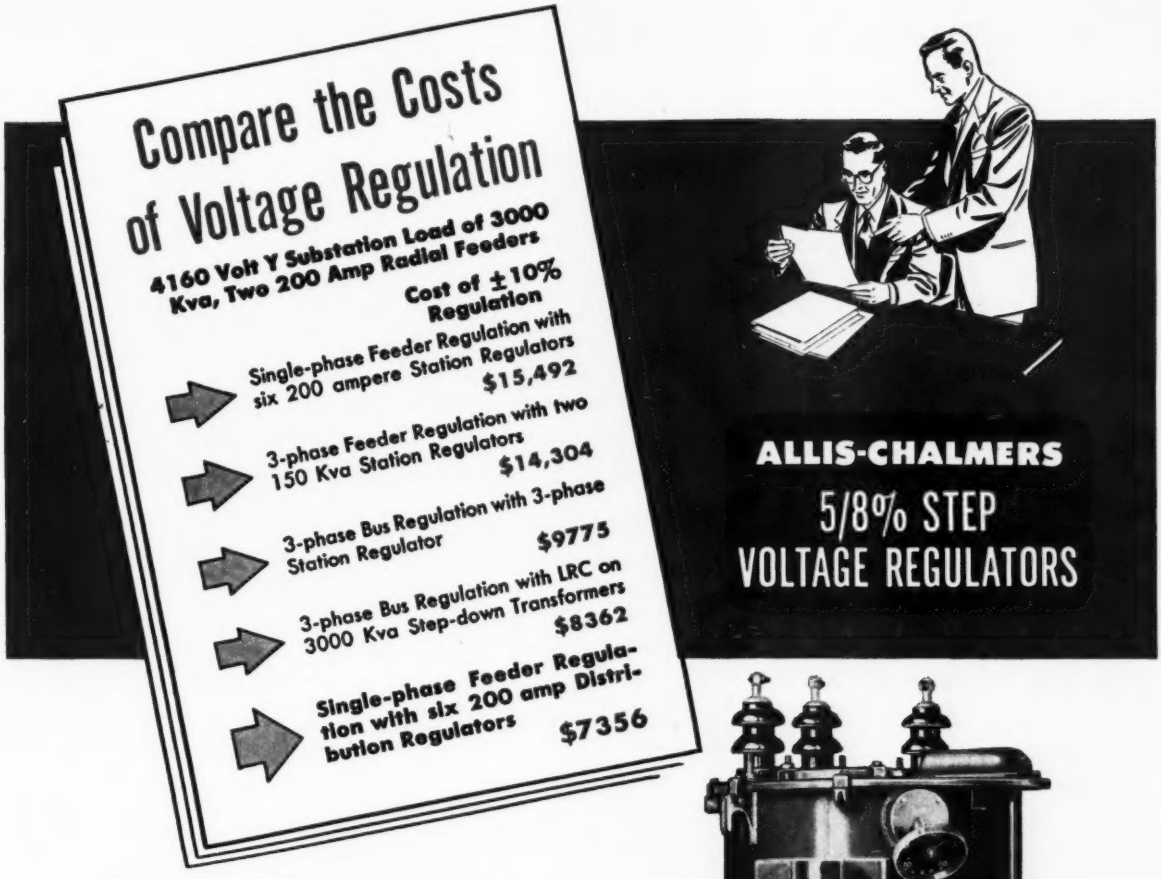
You know it's RIGHT when you specify CHANCE

A·B·CHANCE CO·

CENTRALIA, MISSOURI
SAN FRANCISCO, CALIFORNIA

ANCHORS • GUYING FIXTURES • LINE CONSTRUCTION TOOLS • CONDUCTOR CLAMPS
GROUNDING EQUIPMENT • HOT LINE TOOLS • HIGH VOLTAGE SWITCHES • CUTOUTS

C53-4


Compare the Costs of Voltage Regulation
4160 Volt Y Substation Load of 3000 Kva, Two 200 Amp Radial Feeders
Cost of ±10% Regulation
Single-phase Feeder Regulation with six 200 ampere Station Regulators $15,492
3-phase Feeder Regulation with two 150 Kva Station Regulators $14,304
3-phase Bus Regulation with 3-phase Station Regulator $9775
3-phase Bus Regulation with LRC on 3000 Kva Step-down Transformers $8362
Single-phase Feeder Regulation with six 200 amp Distribution Regulators $7356
ALLIS-CHALMERS
5/8% STEP
VOLTAGE REGULATORS

Get Accurate, Reliable Service

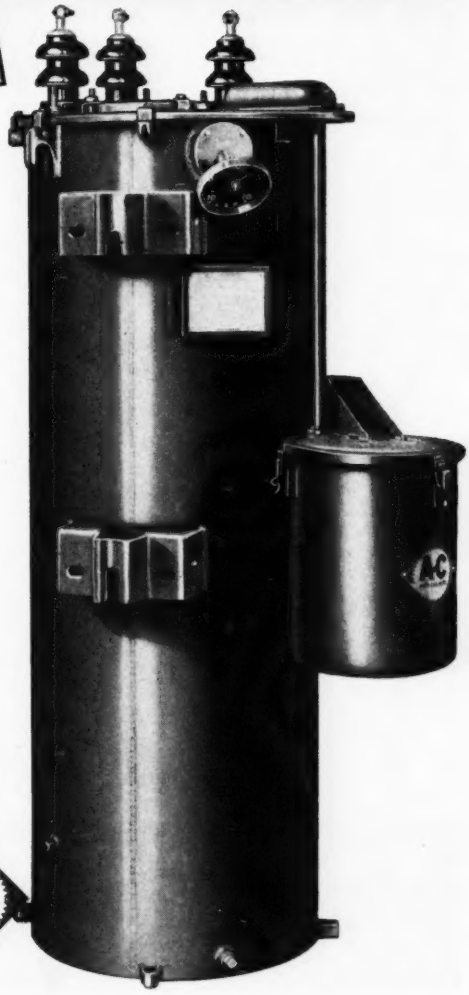
The chart above shows why it will pay you to analyze changes in system economics brought about by Allis-Chalmers distribution regulators. They give you highest quality voltage regulation at a cost lower than any other method of regulating voltage.

Result of 20 Years of ⅝ % Development

Allis-Chalmers distribution regulators give you all the advantages of ⅝% step regulation. You get a ± 1 volt band, 20% range, and a wide line that includes a rating for nearly every voltage need. In addition, you get Allis-Chalmers features like "Feather-Touch" control, unit-type construction, long-life contacts, and a mechanism that can withstand five million operations.

Get Cost Comparison Charts

A set of six charts is available to help you analyze savings you can make on many different systems with Allis-Chalmers distribution regulators. Call your nearby A-C district office or write Allis-Chalmers, Milwaukee 1, Wisconsin, for full information. A-4043



ALLIS-CHALMERS

Originators of ⅝% Step Regulation

"Get cleaner threads, tighter joints with Buckeye Conduit!"

AN ELECTRICIAN TALKS ABOUT CONDUIT: "I agree with other electricians that "Buckeye" gives a clean and strong thread. A clean thread is essential for making a really tight, safe joint! Youngstown rigid steel conduit is tops."

ELECTRICAL ENGINEER ENDORSES BUCKEYE CONDUIT: "As an electrical engineer, I have jobs which demand wiring which must withstand vibrations and shock. By specifying "Buckeye" I protect these wires because only good steel produces threads strong enough to make tight and safe joints."

Youngstown makes rigid electrical conduit from start to finish. This enables Youngstown to control the complete manufacturing process which insures that each length of "Buckeye" is made of topgrade steel. Since only high quality steel produces a clean, strong thread, it's no wonder that "Buckeye" is a favorite in the industry. On your next job, be sure to specify Youngstown Buckeye conduit.

Shipments of Buckeye rigid steel conduit are now being made from our conduit mills at Indiana Harbor and Youngstown.

QUALITY Y YOUNGSTOWN SERVICE

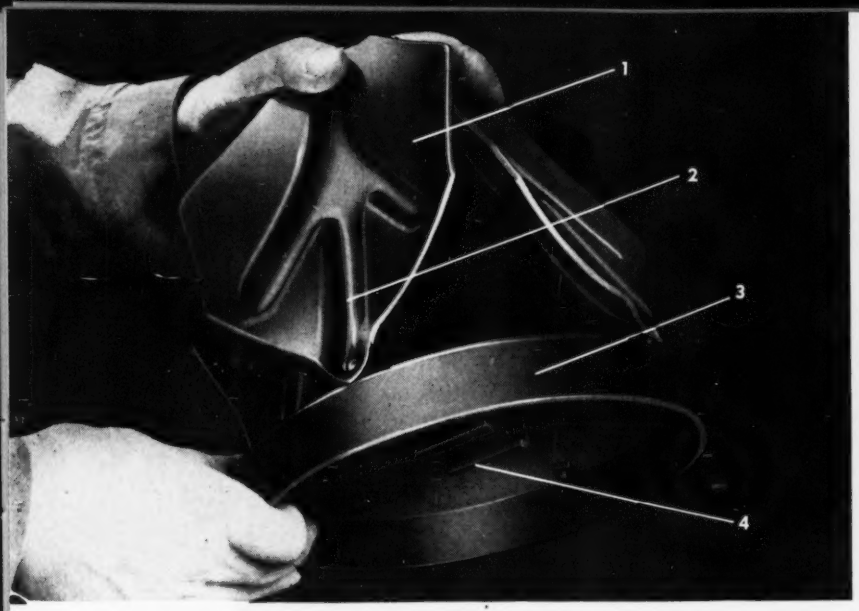
THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel

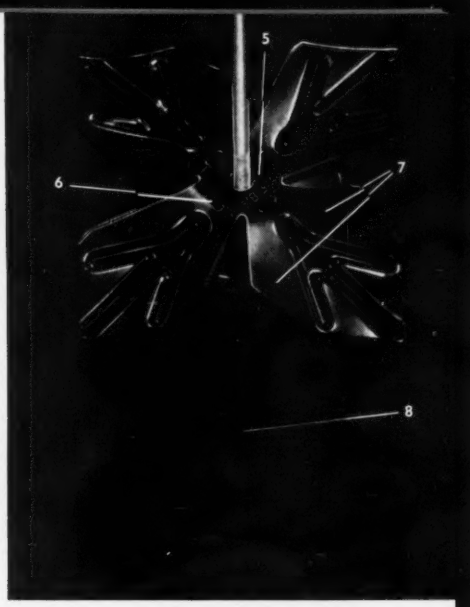
General Offices — Youngstown 1, Ohio

Export Office - 500 Fifth Avenue, New York

COLD FINISHED CARBON AND ALLOY BARS - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - WIRE - PIPE AND TUBULAR PRODUCTS - CONDUIT - RODS - SHEETS - PLATES - BARS - RAILROAD TRACK SPIKES



Heavy, shovel-shaped blades (1) slide into the earth with minimum disturbance. Ribs (2) on the underside stiffen the blades and cut friction against base. Heavy domed base plate (3) with deep skirt for strength. Nut retainer channel section (4) welded to the underside of base keeps the rod from pulling the nut through the base.



Note the large, square tamping area (5) and the wid hinged sections (6) which keep the blades from twistin if a stone is encountered while the anchor is being expanded. "Ears" (7) inside the center of gravity of two opposed blades give additional area for holding power, better balance. (8) "Projected Area," as L-M figures it, is the area of the shadow cast by the expanded anchor, not the total surface area of the plates including vertical sides of ribs as usually figured.

Tests Show L-M Anchors Have High Strength, Minimum Creep

The value of an anchor depends both on its inherent strength, and on its ability to resist creep. You can realize the importance of creep better if you take an actual example. Let us suppose a line built with 35-foot poles at 200-foot span, and 8-inch sag. If an anchor guyed at 60 degrees had a 4-inch creep, the resulting sag would be 86 inches! No wonder utility men are cautious about creep!

Design Based on Extensive Tests

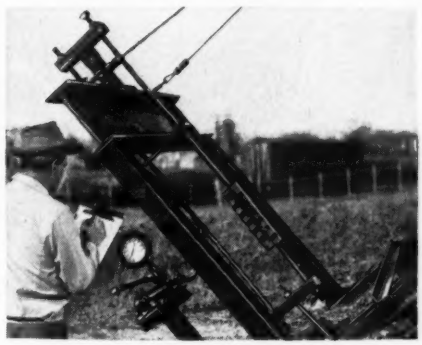
The design of L-M 4-way expanding anchors is based on a very extensive series of pull tests. As shown in the small photo, anchors were buried, and pulled with a hydraulic lift, till the anchors gave or the rods broke. One after another, weak points were eliminated, and the anchor was redesigned to cut creepage.

The features shown in the illustrations are the result of this test program. We feel this L-M anchor is the finest you can get. It assures the greatest strength with minimum creepage.

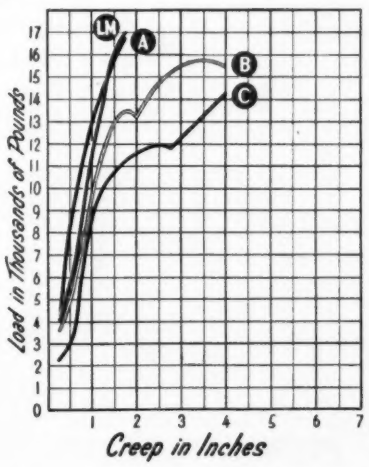
The four blades are formed of a single piece of steel, shaped, and held to the base by four small bolts that shear off easily by tamping.

Ask the L-M Field Engineer

For catalog information and samples if you wish, ask the L-M Field Engineer who calls on you; or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division). 116



Pull Test Equipment: Hydraulic lift on U-shaped steel frame with pump and pressure gauge for recording the pounds of pull applied to anchor rod. Tests were made both at vertical and at 45 degree angles.



In tests with 3 comparable anchors the L-M-designed anchors held creepage to a minimum, even at loads of 17,000 pounds.

Available in 3 Sizes

Catalog Number	Diameter—Closed—Inches	Expanded Area—Square Inches	Nominal Holding Power Class—Pounds	Anchor Rod Diameter—Inches	Minimum Mechanical Strengths Without Noticeable Deformation—Pounds
200026B1	8	110	6,000	⅝, ¾	16,000
200026B2	8	125	8,000	⅝, ¾	21,000
200026B3	8	132	10,000	1	24,000
200026B4	8	132	10,000	⅝, ¾	24,000

All 3 sizes are REA-approved, and have been thoroughly tested by both L-M and by utility companies. You can depend on them to hold!

LINE MATERIAL

Line Construction Materials

foremost in contemporary lighting

There is a Prescolite for any commercial or residential installation. Easy to install, **Easier to sell!** Exclusive features, pre-wired units. Wide range colors, styles and finishes — unit packing, easy to stock and reship.

Write for complete new catalogs to: Prescolite 2229 Fourth Street, Berkeley 10, California.

A-1 Architectural
R-7 Recessed
S-2 Swivel

PRESCOLITE MANUFACTURING CORPORATION
Berkeley, California **Neshaminy, Penn.**

See our CATALOG in SWEET'S FILE ARCHITECTURAL

See your distributor or your nearest Prescolite sales representative.

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Baltimore, Md.—T. H. Bailey, Jr., 409 National Marine Bank Bldg.
Boston 10, Mass.—John W. Fay, 176 Federal Street
Cedar Grove, N. J.—P. M. Sales Co., 118 Sunrise Terrace, Box 14
Chicago, Illinois—Rudolph H. Soukup, 1585 Merchandise Mart
Cleveland, Ohio—Cam Norton Company, 2725 Derbyshire Rd.
Dallas, Texas—John Hancock Company, 2921 Fairmount
Dayton 2, Ohio—Gary Roof & Assoc., 1147 Third National Bldg.
Denver, Colo.—Kenneth B. Schumann, 1073 Galapago St.
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Knoxville, Tenn.—C. E. Pitner, P. O. Box 693
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Milwaukee, Wisc.—Willis H. Murphy, 4520 N. Woodruff Ave.
New Orleans, La.—E. J. Hagan, 3820 Louisiana Ave.
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St. Paul, Minn.—Charles L. Schwab, 345 N. Wheeler
St. Petersburg, Fla.—Frank C. McPherson, 6417 - 7th Ave., North
San Diego, Calif.—John Allen Ware, 301 West "G" St.
Seattle, Wash.—Gleasons, 901 E. 45th Street
Syracuse, N. Y.—Fay-Sullivan, Inc., 1117 Cumberland Ave.
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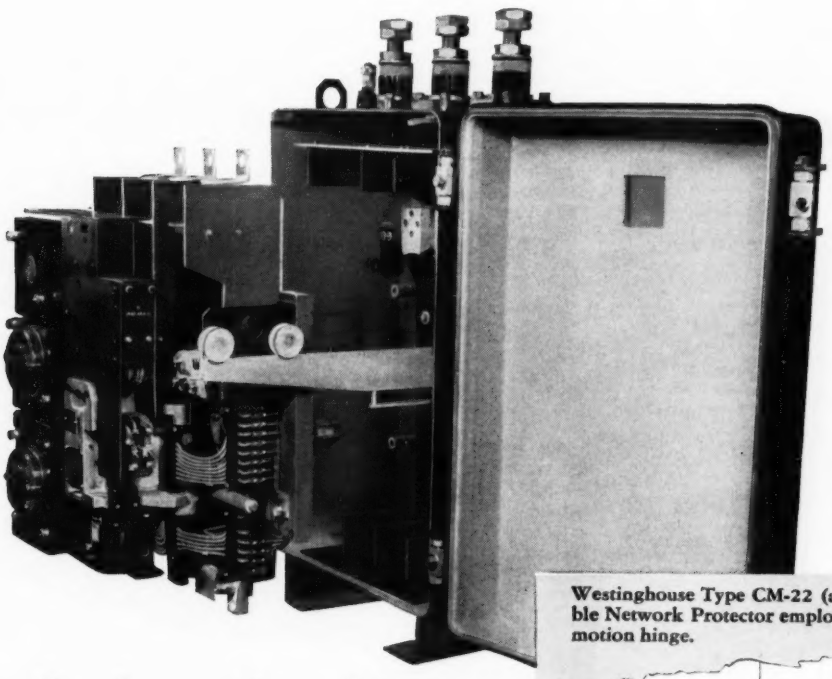
Mexico City, D. F.—Egon Mabardi, 45 Uraquay
Export Agents: Uniworld Industrial Mart, 31 E. 10th St., New York, N. Y.



Westinghouse Type CM-22 (above) submersible Network Protector employs the new dual-motion hinge.

NEW, dual-motion hinge

SIMPLIFIES CLOSING OF NETWORK HOUSING

Now, the exclusive Westinghouse quick-opening, submersible Network Protector housing—which eliminated 26 to 44 bolts—has been further improved to simplify the operator's job. A new dual-motion hinge permits the cover to ride forward before it is swung open. This action relieves gasket pressure... leaves no restraining force to work against when closing the cover.

Your operators will like the simplicity and convenience of this Westinghouse "plus," as well as other housing features such as captive hardware, factory-adjusted stop nuts, and provision for hinging on either side. You'll like many additional, exclusive features built into all Network Protectors. For complete information, contact your Westinghouse Representative or write: Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

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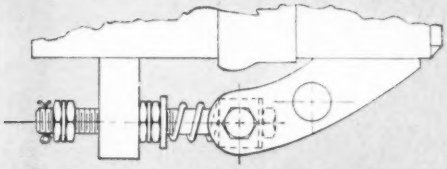
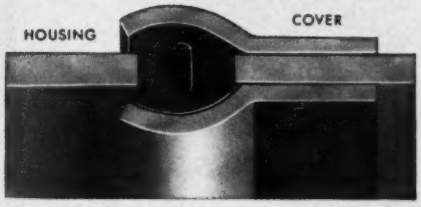
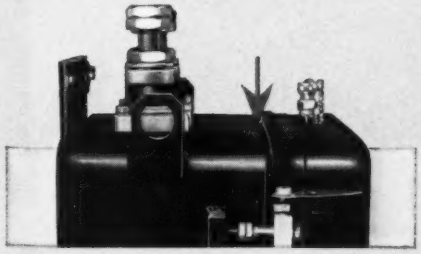


Dual-motion hinge detail. Factory adjustment for centering cover is independent of adjustment for gasket deflection.



Tubular Neoprene gasket compressed between machined edges on housing and cover provides a tight seal.



Top of network housing showing uniform gap between housing and gasket before tightening cover. This prevents the hinge side of the cover from "rolling" the gasket.

YOU CAN BE SURE... IF IT'S

Westinghouse

NETWORK PROTECTORS

NETWORK SYSTEMS PAY... IN *Oklahoma City*

OKLAHOMA CITY'S DOWNTOWN GROWTH . . . In 1926, the load on the network area of .083 square mile was about 4,000 kva. Since then, the business area has expanded to .19 square mile, and load has increased to 30,000 kva. This is 7½ times the original load and 2⅓ times the area.

Underground network proves long-term system solution!

Twenty-five years ago, the Oklahoma Gas and Electric Company took an important step for Oklahoma City. They embarked on a long-range system plan enabling them to comfortably and profitably meet a load that has grown 7½ times in an area that has more than doubled. So well did they plan, that even greater expansion can be accommodated without uprooting their basic system.

WHAT THEY HAD . . . In 1926, Oklahoma City's downtown area was served from an overhead 2400-volt, delta primary system with single-phase, 3-wire lighting and 3-phase, 3-wire power. In some cases, the load was such that an entire circuit served only one block. Naturally, conditions like this created problems. Pole space was needed for transformers . . . feeder capacity was inadequate . . . substation space and feeder routes were required. Overlooking appearance, an overhead system might have solved existing problems; but the Oklahoma Gas and Electric Company wisely anticipated future expansion and load growth.

WHAT THEY DID . . . Long-range system planning based on practical and economical objectives indicated the installation of an underground, low-voltage A-C Secondary Network System. The initial system was supplied from three 13.8-kv primary feeders through 10,800 kva of network transformers and associated network protectors, to a 3-phase, 4-wire, 120/208-volt secondary network, with primaries bus-regulated.

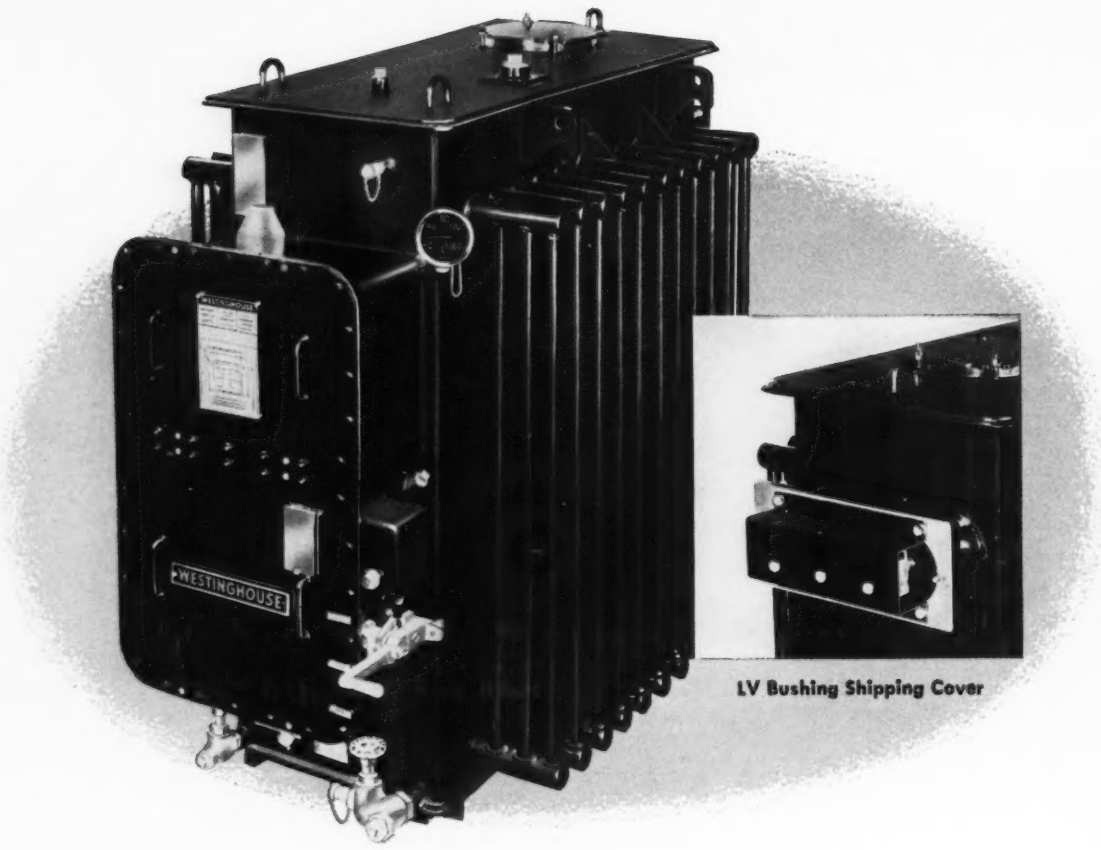
WHAT THEY NOW HAVE . . . That basic system installed 25 years ago has proved the most economical method of meeting increased load and area growth at every stage of Oklahoma City's expansion. At present, the system has five primary circuits, individual feeder regulation and 40,000 kva of installed network transformer capacity. What's more, there have been few voltage complaints . . . no outages, thanks to network operation . . . and maintenance expense has been almost negligible. System planning has enabled this utility to take full advantage of the latest improvements in the design and reliability of modern unitized electrical apparatus.

Decide now on objectives for your future system, or for making replacements to your present system. Our engineers are ready to help you in your network system planning. Call your nearby Westinghouse Office, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-97157

YOU CAN BE SURE...IF IT'S

Westinghouse

NETWORK EQUIPMENT



LV Bushing Shipping Cover

QUALITY in the transformer ADDS RELIABILITY to the network

Everyone agrees that when you install a network system, you install *the best* for reliability and service continuity.

But the degree of reliability...or, more exactly, the freedom from maintenance, depends directly on quality in the transformers.

That's why Westinghouse Network Transformers have continuously wound coils of sliverless copper, to guard against hot spots, crystallization and pricked or scored insulation. That's why they're high-frequency tested, too.

In addition, Westinghouse Transformers are filled under vacuum, and have welded-on covers to assure a perfect seal. Finishes are not only baked for longer life, but bases are undercoated.

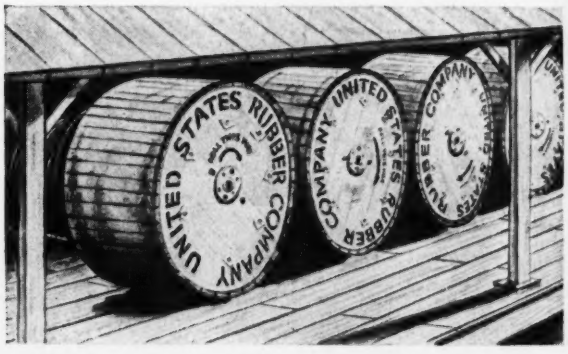
There are many other features such as the LV bushing shipping cover, shown above, that assure safe delivery of the quality built into Westinghouse Network Transformers. Your Westinghouse representative will be glad to give you full information, or write direct to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-70646

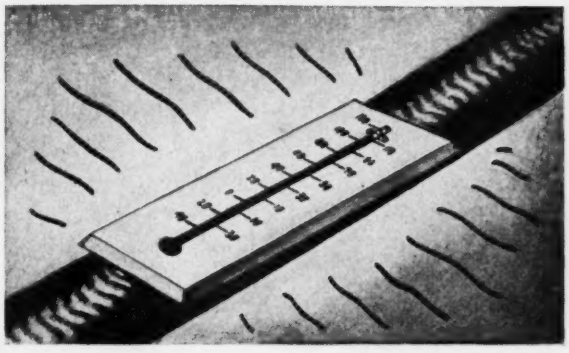
YOU CAN BE SURE...IF IT'S

Westinghouse

NETWORK TRANSFORMERS

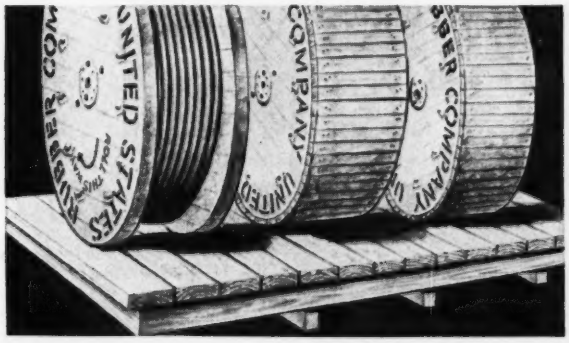
How to prolong the life of wire and cable by proper storage

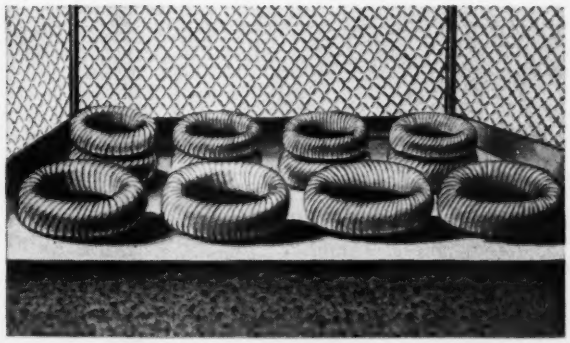




1 **Protect cables from the weather.** Moisture is especially injurious to fibrous coverings. When stored out-of-doors, if they become wet and then freeze, they will be weakened and the saturant will flake off. In humid weather, mold growth is accelerated, weakening the covering and making it easier to damage the cable during installation. (Rubber and thermoplastic insulated and jacketed cables may be stored under moderately humid conditions.) The larger sizes of fibrous covered and rubber jacketed cables and all lead-sheathed rubber insulated cables must be stored on reels which must be properly lagged—or the cable must be otherwise suitably protected against mechanical damage. Reels can be stored out-of-doors if the cable is protected against sun and weather, and the ends are properly sealed.

2 **Don't expose wires and cables to extremes of temperature.** Chemical reactions occur at a higher rate at high temperatures than low. The greatest deterioration of low-voltage cables is due to chemical changes, oxidation or internal changes in the compound itself. Never store reels in the boiler room unless you use a fan to blow hot air away from the wires and cables. It's best to store cables at room temperatures indoors out of direct sunlight. Rubber insulated cables may be stored and handled without damage at the lowest temperatures ordinarily encountered, but thermoplastic synthetic insulated cables should not be handled at temperatures below –10 C. (14 F.)





3 **Reels should be kept off the ground,** so that moisture will not harm the cables, reel flanges and lagging. Sound reels are easier to handle and there is less chance of injury to the cable as it is removed from the reel.

4 **Coils should be stored one layer deep on the floor or shelves,** with the axis either horizontal or vertical. To save space, they may be stacked, but not more than 5 coils in height—otherwise there is harmful pressure on the insulation. Don't remove brown paper or box that protects against dust and light until used.

5 **Rubber insulated fibrous covered, rubber jacketed or lead-sheathed cables in storage** should never be bent to a diameter less than I.P.C.E.A. recommended diameters. Never let coils or reels drop more than a few inches. Always roll a reel in the direction indicated by the arrow on the flange. When rolling an unlagged reel, put planks under the flanges to avoid pressure on the cable. Coils, reels and spools should always be rotated when wire and cable is removed to avoid twisting the cable.

FREE REPRINTS OF THIS PAGE ARE AVAILABLE. WRITE TO ADDRESS BELOW.

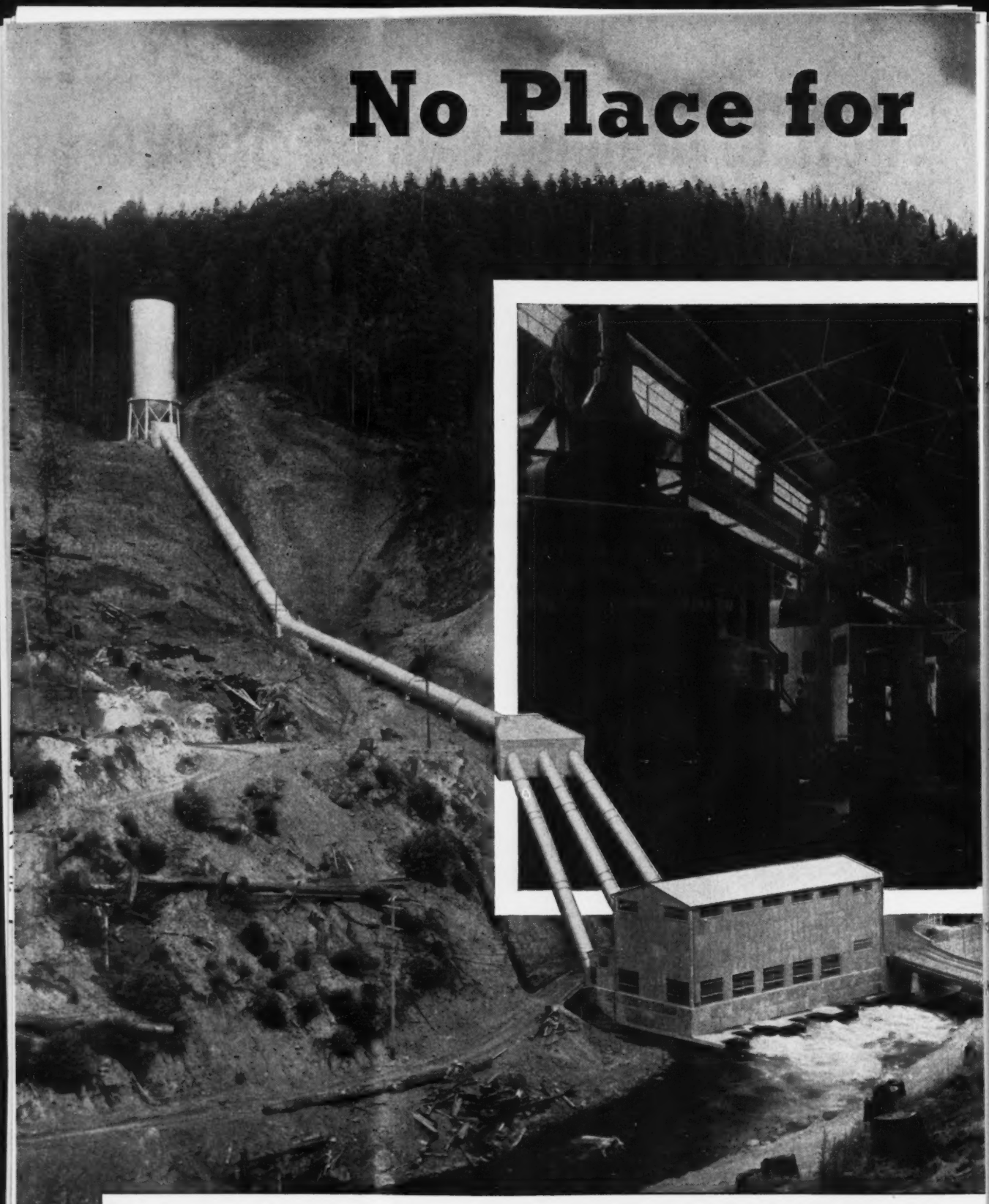
UNITED STATES RUBBER COMPANY

U.S.RUBBER
SERVING THROUGH SCIENCE

Electrical Wire and Cable Department

ROCKEFELLER CENTER • NEW YORK 20, NEW YORK

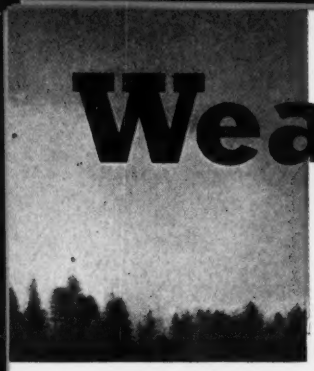
No Place for



Equipment for Power: Water Conditioning equipment, chemicals and service . . . Steam and Hydraulic Turbines . . . Generators . . . Condensers . . . Steam Jet Air Ejectors . . . Power Plant Pumps and Motors . . . Transformers . . . Circuit Breakers . . . Switchboards and Control . . . Switchgear . . . Unit Substations . . . Utilization equipment.

ALLIS-

Weaklings!



Equipped with three Allis-Chalmers 16,667-kva, 6900-volt, 400-rpm, suspended-type synchronous generators installed in 1949, The California Oregon Power Company's Toketee Falls station acts as the supervisory plant for remote control of several isolated, single-unit stations.

For information about Allis-Chalmers hydraulic turbine-driven generators, write for Bulletin 05B7549.

Limited Accessibility of The California Oregon Power Company's Toketee Falls Hydro Station Puts Premium on Generator Dependability

AT BEST, there's no streamlined, sea-level route to the Toketee Falls Power Plant on the Umpqua River. That's apparent from the view at the left. And a man-sized layer of snow is normal there for the winter months. Obviously the station's three 16,667-kva generators had to be built with self-sufficiency to match this rugged country.

This assured dependability is the result of Allis-Chalmers half century of experience building hydraulic generators.

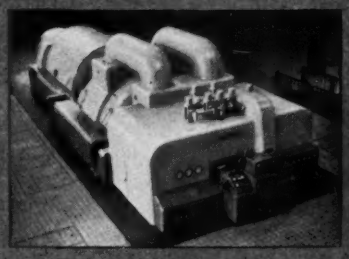
It is also the result of continuous engineering progress. For example, A-C has pioneered development of combined motor-generator and pump-turbine units for storage plant operation. One such unit now under construction will have a motor-generator rated 102,000 hp, making it the largest motor in the world.

Further assurance that each generator is built to give the most economical and satisfactory performance for the given installation stems from A-C's engineering background as the only builder of both generators and all types of hydraulic turbines.

When you need power production or distribution equipment, you gain by calling your A-C representative early in the planning stages. Allis-Chalmers, Milwaukee 1, Wis.

A-3949

IT PAYS TO KEEP PACE WITH MACHINERY PROGRESS

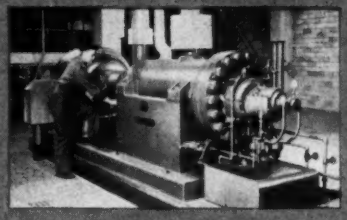


Installation-Proved Supercharged Cooling

Installed in 1951, this turbine generator unit has proved worth of *supercharged* conductor cooling. Resulting increased output per unit size cuts many plant costs.

10,000,000 Kva I.C. 3-Cycle Breakers

For maximum system stability, A-C offers up to 20-20-20 cycle repetitive reclosing. Full mechanically trip-free mechanism assures great reliability of operation.

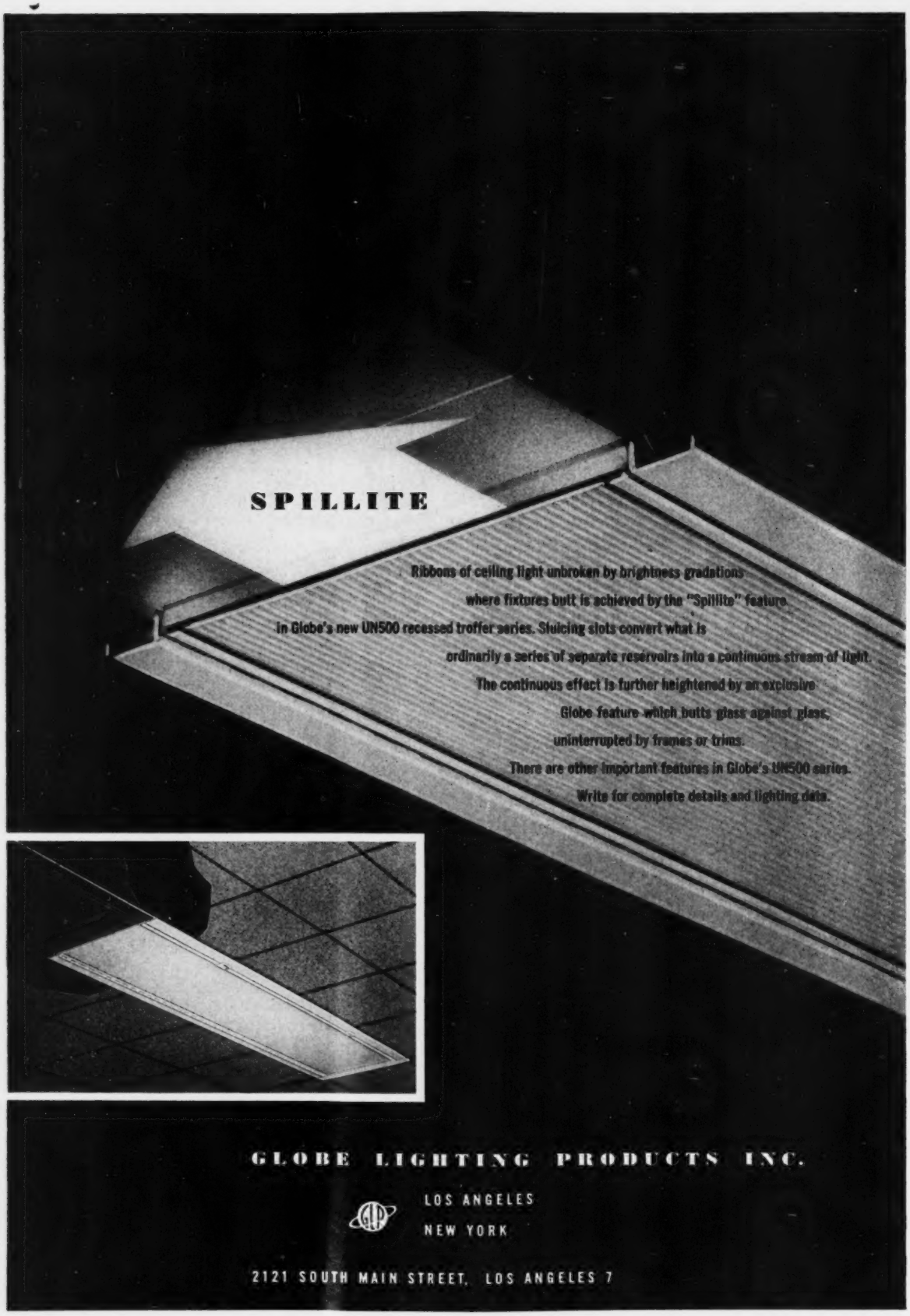


Modern Barrel-Type Boiler-Feed Pumps

Features include external glands, horizontally split inner case, metal-to-metal faces, only one internal gasket. Ratings range from 1200 to 3000 psig, 300 to 2500 gpm.

CHALMERS

A-C ALLIS-CHALMERS


SPILLITE
Ribbons of ceiling light unbroken by brightness gradations
where fixtures butt is achieved by the "Spillite" feature
in Globe's new UN500 recessed troffer series. Sluicing slots convert what is
ordinarily a series of separate reservoirs into a continuous stream of light.
The continuous effect is further heightened by an exclusive
Globe feature which butts glass against glass,
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There are other important features in Globe's UN500 series.
Write for complete details and lighting data.
GLOBE LIGHTING PRODUCTS INC.
LOS ANGELES
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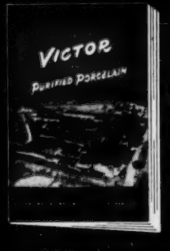
See that hammer falling? It's about to strike the outer edge of a Victor Suspension Insulator with a blow that *greatly exceeds specifications!* This is routine control procedure in Victor's test laboratories. It proves that insulators made of *Purified Porcelain* consistently withstand impacts in excess of NEMA standards. This finest porcelain ever made is more dense, harder, tougher and far more resistant to impact than any other porcelain yet developed. For full data on Victor Suspension Insulators, write for Bulletin No. 4.

Victor No. 900, 10" Suspension Insulator being subjected to impact test in Victor's Test Laboratories.



FREE BOOKLET gives you the full story on how Victor insulators are made—how and why *Purified Porcelain* was developed. Write us for your copy.

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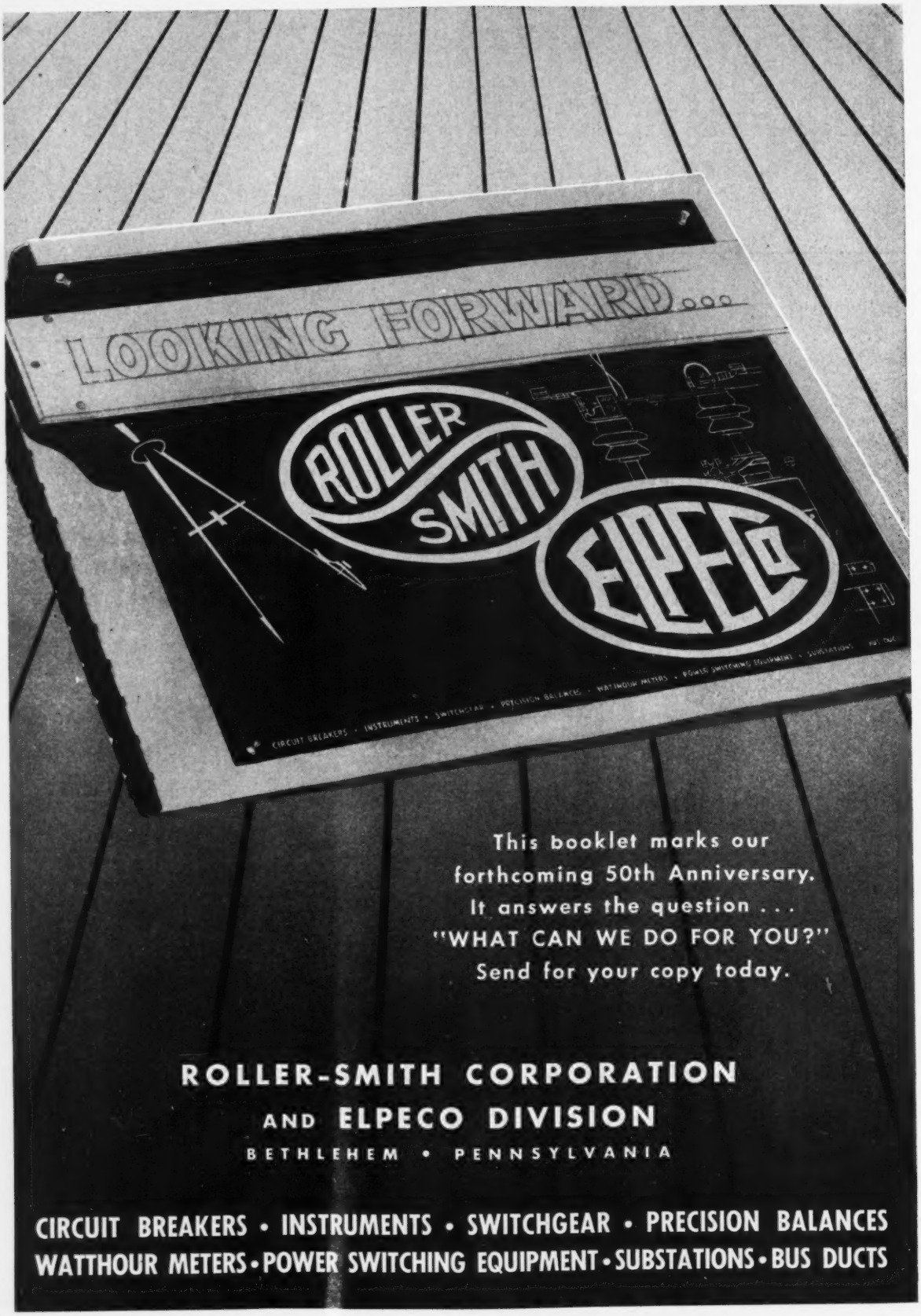
Low and High Voltage Pintypes • Suspensions • Guy Strains • Spools • Switch and Bus Insulators • Custom Designed Porcelain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It answers the question . . .
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ALUMINUM . . . including the *ELECTRICAL WIRE* and *CABLE*

Aluminum Company of America's new headquarters, towering above Pittsburgh's Golden Triangle is a miracle of architecture in aluminum.

This 30-floor, aluminum sheathed structure is a glittering new symbol not only of growing Pittsburgh, but of the increasing use of aluminum itself.

Aluminum was used for all wire and cable conductors, conduit, raceways, connectors, lugs, junction boxes, and other electrical equipment. The Okonite Company supplied a major portion of the aluminum cable.

This installation is typical of Okonite's versatility in the manufacture of insulated cables. Extensive experience for many years with aluminum conductors has provided us with the widest background in the most advantageous applications of insulated aluminum cables for aerial, underground, or conduit installation.

Two new Okonite booklets describe recent developments resulting from our research and engineering experience with aluminum conductors:

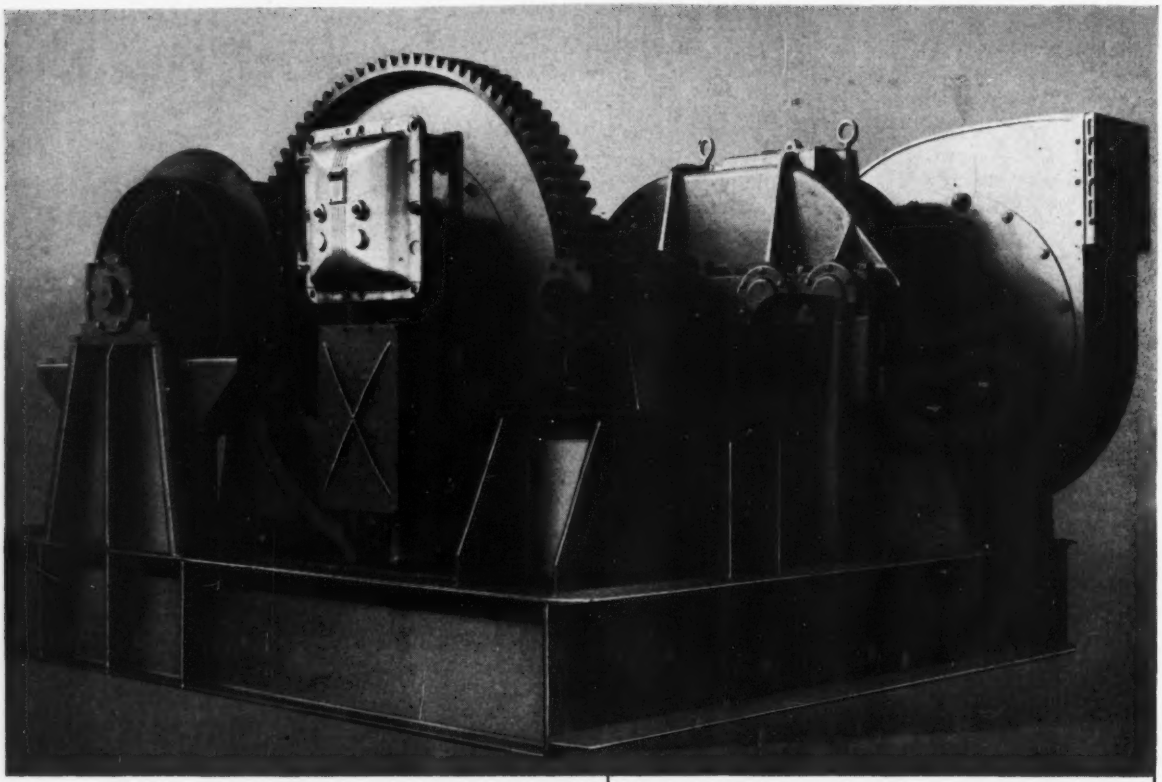
Bulletin WE-1062 discusses the installation and splicing techniques used on the first 15kv paper insulated aluminum conductor underground power cable.'

Bulletin WE-1063 gives new information on the electrical and physical properties of insulated aluminum conductors particularly for use with electrical equipment.

Your request for these booklets will receive our prompt attention. The Okonite Company, Passaic, N. J.

The best cable is your best policy

OKONITE — SINCE 1878 — *insulated wires and cables*



DESIGNED and built by Paceco, this wire rope type hoist uses a fan as a brake for control of lowering. The fan dissipates the energy produced during the lowering cycle. Motor drives through a triple reducer into a large ring gear on the hoisting drum. While common practice calls for 2 drums driven from a single shaft, Paceco has used a single drum with an ungrooved center section. By installing a drum gear in the center, over-all width of unit is reduced, and gears and bearings normally required for two drums have been eliminated. Drum carries its ropes in perfect syncronization—always.

Paceco cordially invites your inquiries on cranes and hoists of all types and sizes.

Built by PACECO

INTAKE GATE HOIST for Arghandab Dam, Afghanistan

(drum and gear guards removed)

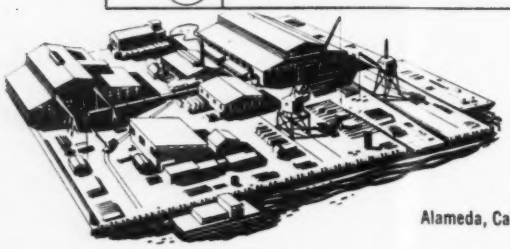
Rated load—71 tons | Maximum lift—162′

Speed of hoisting—2′ per minute

Speed of lowering—6′ per minute

Built for Morrison-Knudsen Afghanistan, Inc.

PACECO®
"TAILORS OF STEEL"



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BullDog UNIVERSAL *Trol-E-Duct*

Lighting on the spot

Another BullDog Thoroughbred Product — Universal Trol-E-Duct is a small-sized, economical duct system that lets you add and relocate lighting fixtures or electric hand tools . . . in seconds.

When lighting needs change, Twist-Out Plugs come out with a flick of the wrist and reinsert *anywhere* along the duct without time-wasting shut-downs. For mobile tools, trolleys are available that ride the track inside the duct . . . they let the tool follow the job.

The rigid steel duct encasing the solid-copper bus bars is simple to install and rugged in use — it will support even the heavier lighting fixtures. The entire system is completely prefabricated . . . can be dismantled and installed *anywhere at any time* without loss of material. The only tool needed is a screw driver!

BullDog Universal Trol-E-Duct has a wide range of commercial and industrial uses. Write today for free Bulletin UT-650 for complete details. BullDog Electric Products Company, Dept. EW-53, Detroit 32, Mich.

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ROCKBESTOS AVA

COSTS LESS INSTALLED

For example, take a 430 ampere load at 40°C Ambient temperature. To use type RH cable, an 800 MCM is required but with Rockbestos AVA, a size 500 MCM cable carries the same load and is 38% smaller.

Three 800 MCM type RH cable requires a 4" conduit, while with Rockbestos AVA, a 3" conduit does the job. What's more, the quicker, easier handling of lighter-weight Rockbestos AVA reduces labor costs substantially.

Compared size for size, Rockbestos AVA (AVC) helps you increase capacity simply by rewiring old conduits. No new larger conduit, fittings and accompanying labor are needed.

All because Rockbestos AVA (AVC) insulation's dielectric strength is *so well protected* it takes less to do the job . . . and assure maximum dependability through the years. Write for booklet "Cut Current Carrying Costs".

It's the A.V.C. "Sandwich" that makes the difference.

Inner Felted Asbestos Wall
Varnished Cambric
Outer Felted Asbestos Wall
This "sandwich" protects the varnish cambric. It enables A.V.A. to carry more current than cables with conventional insulations.

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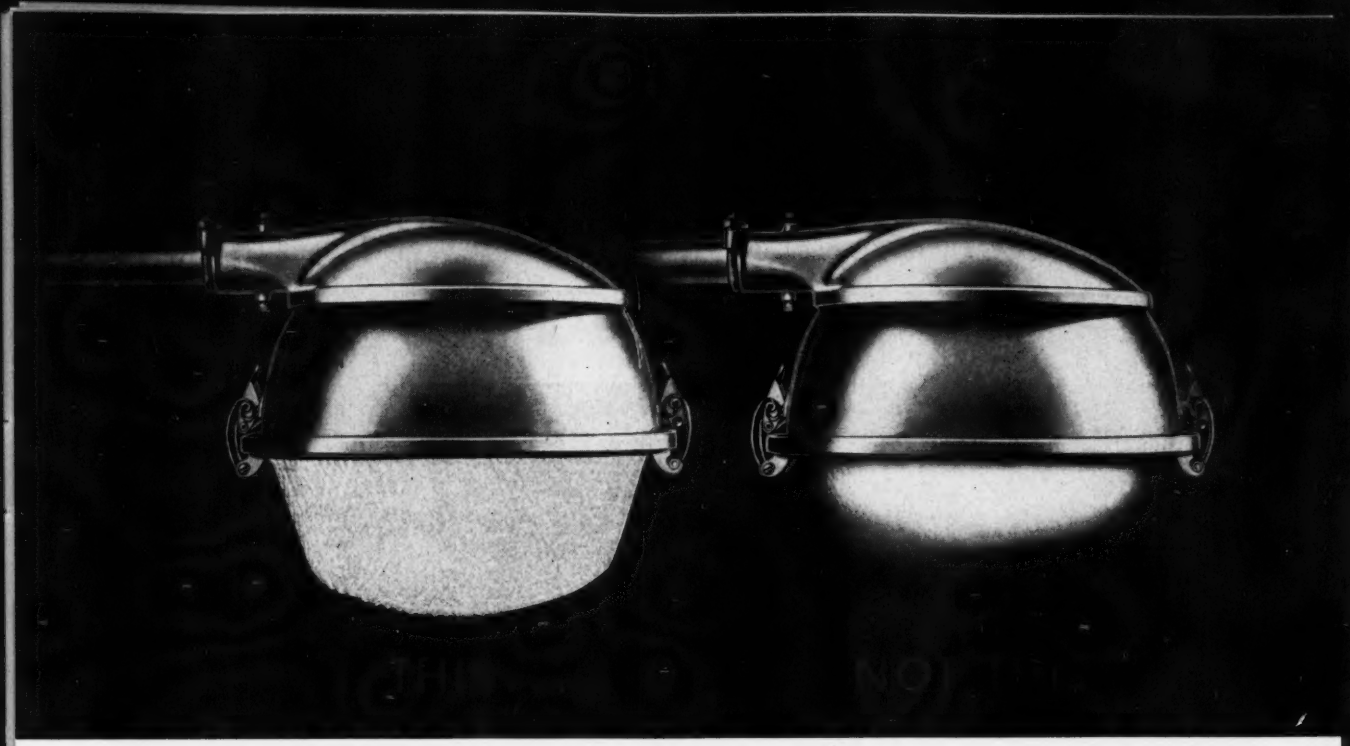


L-M "Ovalite" Design Cuts Glare, Provides Uniform Light Distribution On The Street

The two major requirements for good high-intensity lighting in business and traffic areas are:

1. minimum glare from the light source;
2. uniform lighting on the street surface.

Seen against a dark background, every lighting unit has some glare. The problem is to reduce the glare to a minimum. Glare obscures the roadway and makes it difficult to see pedestrians or unlighted objects in the street.

The L-M Ovalite is so designed that glare is reduced, while at the same time light is distributed more evenly on the street surface. Here's how we do it:

The mercury vapor lamp is placed so that the light center is about 2½ inches above the bottom edge of the reflector. Thus, when you are driving down the street, you don't look directly at the lamp.

The reflector is so designed that it distributes the light evenly on the glassware, so that no one area receives a majority of the light.

Vertical prisms on the inside of the glass refractor raise the angle of the light emitted from the refractor, directing it to give uniform surface brightness on the glassware, and at the same time distributing it evenly over the street area.

The result, so far as glare is concerned, is seen by comparison of the two photographs at the top of the page. In the left-hand unit, the Ovalite, light is distributed evenly from all parts of the glassware. The right-hand unit, which does not have the same efficient optical system, has a hot spot along the top edge of the glassware, which causes glare and uneven light distribution.

With its freedom from glare and its uniform distribution, the Ovalite gives greater safety and more efficient use of the light. Its optical system provides the wide distribution needed for business streets, shopping areas, and boulevards.

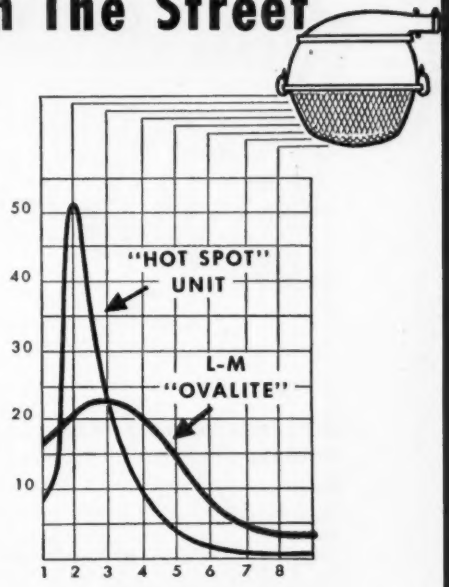
The Ovalite has many other good features—asbestos-covered internal wiring, strong construction, a double-hinge latch so you can swing the glassware down from either side. That makes servicing quick, easy, and safer.

Get The Whole Story

Ask the L-M Field Engineer for the "Ovalite" Bulletin—or write Line Material Co., Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

LINE MATERIAL

Street Lighting



Tests Demonstrate Ovalite's* Uniform Brightness Distribution

To determine the relative brightness distribution of the "Ovalite" and a "hot spot" luminaire, measurements were made of the brightness of successive strips of the surface of each luminaire. Readings were taken in the main beam of both luminaires. The chart above shows that the brightness of the "Ovalite" is much more even, while the other luminaire peaks up, especially near the top of the glassware, which accounts for the hot spot seen in the right-hand picture at the top of the page. 121

*"*Ovalite*" *is a Line Material Company trademark.*

USE A FLEXIBLE RING BUS

Without the Usual High Cost!

No costly extra cubicles needed! Ring buses are built into standard units of Allis-Chalmers Metal-Clad Switchgear. This economy, together with their other advantages, makes ring bus schemes more attractive than ever.

Important Advantages

First, there's the flexibility of a ring bus as shown in the single line diagram above. For example, one breaker functions as both a feeder breaker and a bus tie breaker, and it is possible to feed each circuit from either of two breakers. In addition, a ring bus provides continuous service while a circuit breaker is taken out for routine maintenance.

While these advantages can be enjoyed with other circuit arrangements, additional equipment is usually required and it becomes too expensive. As a result, ring bus schemes are often overlooked. But with Allis-Chalmers switchgear a ring bus scheme is simple. The only change from standard construction is the diagonal bus from the front of one unit to the rear of the adjacent unit.

It's time you enjoy the flexibility of a ring bus with Allis-Chalmers switchgear — without the usual high cost.

Talk it over with an A-C engineer. Call your nearby A-C district office, or write Allis-Chalmers, Milwaukee 1, Wis.

A-4001

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

"For High-Accuracy, Long-Life Resistors we wind with D-H Electrical Alloy Wire"

. . . so states INSTRUMENT RESISTORS COMPANY, of Union, New Jersey, manufacturers of IN-RES-CO quality-built resistors for every electrical and electronic application

IN-RES-CO resistors are wound to meet the most critical requirements without excessive cost; standard inductive and non-inductive units are available in resistance ranges from 0.01 ohm to several megohms—with power ratings from a fraction of a watt to 10 watts. Included, are types especially suited to counter excessive humidity, fungus, space limitations, and temperature rise.

Says Instrument Resistors Company: "For 23 years, we have devoted our facilities exclusively to the development and manufacture of quality resistance components. The fact that today, with such a wealth of experience to our credit, we specify Nichrome, Karma, and D-H Manganin wire for windings, constitutes the strongest endorsement we can offer of these Driver-Harris products."

Nichrome*, Karma*, and D-H Manganin deliver top-level performance—their characteristic electrical and physical properties remaining unchanged even under exceptionally exacting operating conditions. They are ready to go to work for *you*, too—as are more than 80 other Driver-Harris alloys. Profit by consulting with us. We shall be glad to make recommendations based on your particular needs . . . and are confident we can meet your resistance requirements with D-H alloys that will assure the best possible results.

Nichrome and **KARMA** are produced only by

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Main Office and Plant: HARRISON, NEW JERSEY

*T.M. Reg. U. S. Pat. Off.

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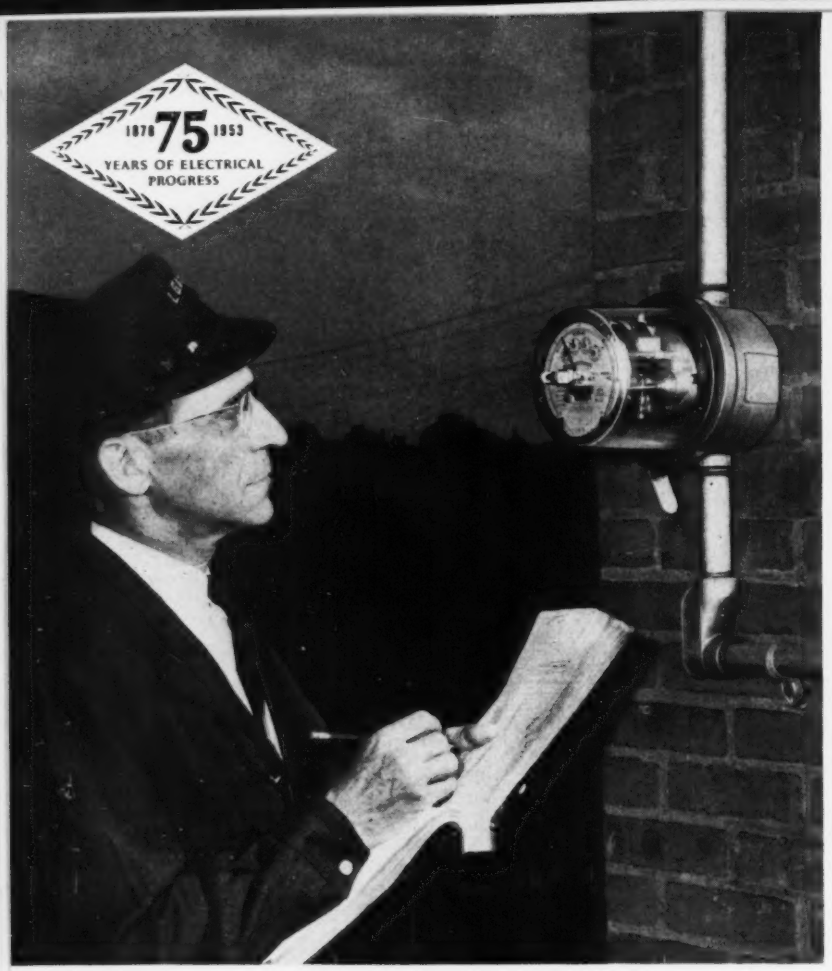


IM-50 METERS are available for socket (left) or front (above) connections, with variations up to 10% of rated meter voltage permissible.

I-50 FEATURES such as magnetic suspension, die-cast frame, and molded insulation provide sustained accuracy and reliable performance.

IM-50 Meters Give Accurate, Low-Cost Demand Measurement

Moderate price and low installation cost make the General Electric IM-50 watthour demand meter the type best suited for measuring demand of small industrial and commercial power users.

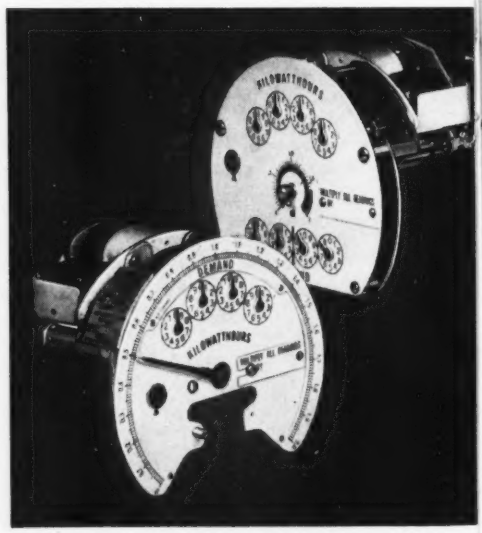
The watthour meter is the well-known Type I-50, having such benefits as magnetic suspension (no meter-bearing wear), lightning protection, and sustained calibration—which combine to give accurate and reliable performance with little maintenance. The demand register is a mechanical block-interval type—either indicating (M-30) or cumulative (M-31).

QUICK, EASY RESETTING—The reset mechanism is simple and readily resealed, requires only one hole in the glass cover, and is corrosion-resistant to prevent sticking with rust.

Interval resetting is positive and precise, with no impact upon returning to zero. This minimizes wear and the possible necessity for occasional readjustment.

ADJUSTMENTS MINIMIZED—The register has few adjustments, all accessible and easy to make. Freedom from wear, together with high factors of safety, reduces any subsequent readjustment to the minimum.

For more information, contact your G-E representative or write Section 601-93, General Electric, Schenectady 5, N. Y.



INDICATING OR CUMULATIVE REGISTER is used. Either can be purchased separately for use on watthour meters that are now in service.

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

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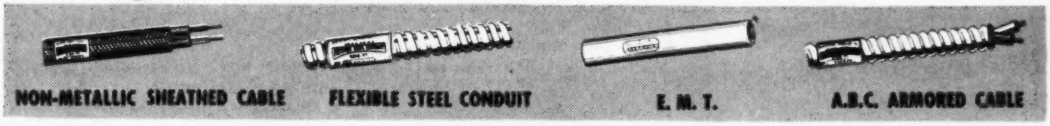

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LETTERS TO THE EDITOR

Editor's Note—When ELECTRICAL WEST requested a report on how the wiring had survived the shocks of the earthquakes in Bakersfield, Mr. Gunn replied with this tribute to the various utilities in the area for the extraordinary service they performed in the emergency. We pass it on that all may know. Our thanks to Manager Gunn on behalf of the industry.

To the Editor:

To the best of my knowledge, there is no section of the world where nature does not have one or more unpleasant aspects. Floods, tornadoes, hurricanes (Atlantic), typhoons (Pacific), sandstorms, excessive heat, excessive cold, volcanoes and earthquakes all have their own spheres of operation. Some areas are even afflicted with more than one of those features.

The only one that gives absolutely no warning is an earthquake. Even a volcanic eruption is preceded by rumblings, smoke and other warnings that may be read by experts. But not so with an earthquake, although some have said that they hear a noise just before disaster strikes. The author freely admits that, while he has been through a major earthquake and two major aftershocks, the only sounds he has heard are his own teeth and some buildings rattling. It is a never-to-be-forgotten experience.

You can well imagine that the quake of July 21 and the aftershocks of July 29 and Aug. 22 would multiply the problems of municipal administration. The problems that would normally be spread over a period of perhaps 10 years are telescoped into a very few weeks, with a number that would never arise otherwise being thrown in for good measure.

A majority of cities own their local water utility, many own electric systems, a few own gas systems and some even operate telephone utilities. All these utilities are privately owned and operated in Bakersfield.

The author has always kept out of the public-vs-private ownership of utilities controversy. As an administrator I feel that I would be "off base" if I became involved in the city council's prerogative to establish policy. But it is no secret that the city's administrative staff was mightv glad to have utility matters in other hands during our earthquake disaster conditions.

Following the quake of July 21 the Bakersfield City Council took official notice of the splendid service rendered during the emergency by the three privately owned public utilities that operate here, and directed that letters of appreciation be sent to all three. Mayor Sullivan accordingly sent letters to the Pacific Gas and Electric Co., California Water Service Co. and to the Pacific Telephone & Telegraph Co.

It has been said that those three firms performed miracles of service. Actually, of course, there were no miracles involved. What we saw was a number of well-trained experts operating according to a preconceived disaster plan with a minimum of lost motion.

Top management can take credit for conceiving the plans, for choosing and training their really first-class employees, and for instilling a loyalty and devotion to duty that has become traditional in the public utility field. As an administrator, I can recognize and appreciate the tremendous job of administration that has been done.

Then, there are the field and office crews and operators who make the apparent miracles occur. They are the ones who give life and meaning to the plans. The public sees and hears them, and to the public they *are* the utilities. Paid advertising may have helped to some extent, but in my opinion the good repute of privately owned public utilities today is a direct result of good public relations practiced by utility employees at all levels.

We who pay utility bills sometimes think they are pretty stiff. Maybe they are a bit high under normal operating conditions but, as I stated before, there is no place on earth where nature does not have unpleasant aspects and those aspects all cause utility troubles. So now I think of my bill as having two parts, one part being for service under normal conditions and the other part to create a reserve for the time when operating costs multiply.

Most of what I have written is probably old stuff to utility people but I could not resist the opportunity to pay tribute to the men in the ditches and on the poles, the voice with a smile and the management that put them there.

C. LELAND GUNN
City Manager
Bakersfield, Calif.

To the Editor:

Reading your interesting p 68 in your Vol. 110, No. 3, "How Do You Say Free Enterprise?"

Would it help if you called it "Free Enterprise Profit System?"

ASHTON B. COLLINS
Reddy Kilowatt Service
New York 7, N. Y.

P.S. I have just read an article in *Editor & Publisher* magazine of April 4 entitled "24 Denver Firms Start Free Enterprise Series." I notice The Public Service Co. is one of these advertisers so I am sending copy of this letter to our mutual friend, Gaylord Buck, vice-president of that company, calling his attention to your article and asking him what the possibilities are in this proposed series. ELECTRICAL WEST might well be interested in hearing also.

To the Editor:

I have much interest in your article on "Federal Power Empire" in your issue of November 1952. I should be very glad to obtain 25 reprints of this article if such reprints are available.

R. K. HAMLEN
Electric Utility Sales
General Electric Co.
Schenectady 5, N. Y.

To the Editor:

Our attention has been brought to the many excellent points in your article, "How Do You Pick Salesmen?". . . If possible, will you ship us 35 reprints of the article? . . .

NANCY LOUGHLIN
Advertising & Sales Promotion Dept.
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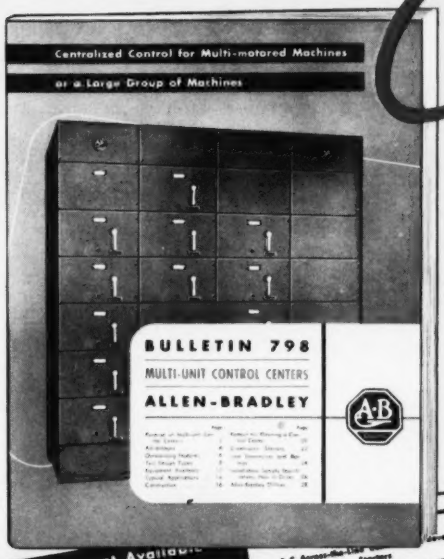
Centralize

YOUR AUTOMATIC MOTOR CONTROLS FOR NEATER, SAFER INSTALLATIONS

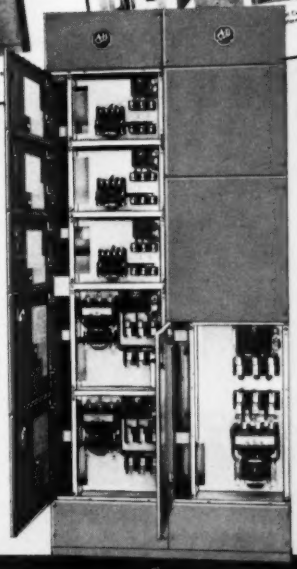
There is a decided trend toward the use of Allen-Bradley Multi-Unit Control Centers. They concentrate all motor controls for a group of machines . . . or for your entire plant . . . in one spot. They make a compact installation that is safer and neater than scattered groups of individual controls. Inspection is centralized for easier and better maintenance.



SEND FOR THIS 28-PAGE ILLUSTRATED BULLETIN

This idea-packed catalog of Allen-Bradley Multi-Unit Control Centers has 58 illustrations and 18 diagrams of intriguing interest to plant engineers. It portrays how interchangeable panels of starters, reversing switches, circuit breakers, disconnect units, relays, and other control devices may be combined . . . just like building blocks . . . to provide precisely the control you need. Shows how easily changes can be made to satisfy revisions in plant layouts. Write for Bulletin 798, today.

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.



4-53-M

A-B Quality

ALLEN-BRADLEY

BULLETIN 798 MULTI-UNIT CONTROLS

QUALITY

MULTI-UNIT CONTROL PANELS

•

EASY TO ADD
EASY TO CHANGE
to meet
Plant Requirements

•

Available with
Manual Disconnect Units
or Circuit Breakers

Plug-in panels are ideal for continuous process industries which must be serviced while the bus is "hot." Fixed connection Multi-Unit Control Panels are popular for most industries.

CENTRALIZED MAINTENANCE

Centralized location of all motor controls promotes regular inspection, discourages tampering by unauthorized personnel, and does away with special mounting provisions so often needed for groups of starters. A-B Multi-Unit Control Centers can be installed more quickly than an equivalent number of separate starters, disconnect units, and accessories.

GREATER PLANT SAFETY

Not only do Allen-Bradley Multi-Unit Control Centers reduce the hazards of accidental personal contact with "live" switch gear . . . they also make possible the centralizing of motor controls in rooms far removed from hazardous gases, dusts, or fumes. They may even be installed out of doors in weatherproof cabinets. Send for Bulletin 798 for details.

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.

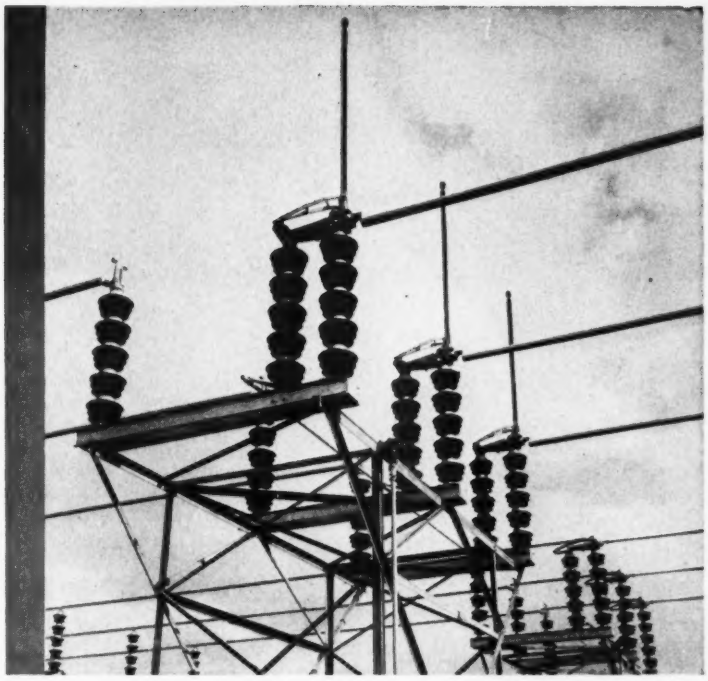
4-53-M

A-B Quality

ALLEN-BRADLEY

BULLETIN 7[illegible] MULTI-UNIT CONTROLS

QUALITY



SCHWAGER-WOOD TYPE TA SWITCH

Here are two of 77 Schwager-Wood Switches —rated 230 KV—1200 amperes —furnished to the Bonneville Power Administration. These switches conform to the highest standards and are available in all NEMA voltage and amperage ratings for outdoor air switches.

SW SCHWAGER-WOOD CORPORATION

PORTLAND, OREGON

Technical information and prices available on request from any of our regional representatives or the home office, 8024 S.W. 35th Avenue, Portland 19, Oregon.

BILLINGS, MONTANA
P. O. Box 619
Victor L. Wisoki

BIRMINGHAM, ALABAMA
447 American Life Bldg.
Walter E. Thompson Co.

DENVER, COLORADO
100 13th Avenue
Slaybaugh-Thompson Co.

DES MOINES, IOWA
5707 Waterbury Circle
Charles L. Ward Co.

KANSAS CITY, MISSOURI
3122 Roanoke Road
Charles L. Ward Co.

NEW YORK 7, N. Y.
125 Barclay Street
Russell D. Heath

OKLAHOMA CITY, OKLA.
P. O. Box 8293
Charles L. Ward Co.

PASADENA, CALIFORNIA
Box 67-C
A. B. Smedley

SALT LAKE CITY, UTAH
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Clarence W. Silver

SAN FRANCISCO, CALIF.
461 Market Street
K. M. Ryals Co.

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1914 Market Street
Love Electric

HIGH VOLTAGE SWITCHGEAR

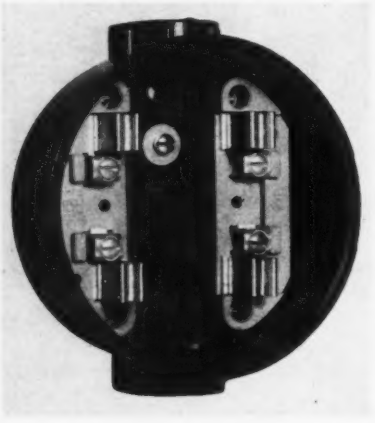
BUS FITTINGS AND CONNECTORS

SUBSTATION DESIGN AND EQUIPMENT

PRODUCT NEWS

Die-Cast Meter Socket

(1) Square D Co., 4335 Valley Blvd., Los Angeles, Calif.



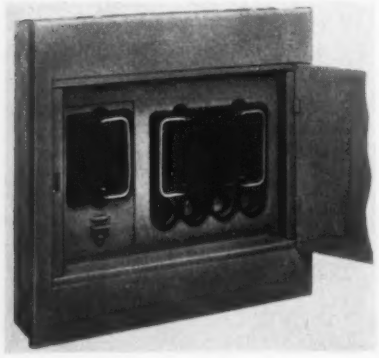
This new weatherproof, watertight die-cast meter socket is designed with reversible jaws and can be adapted in the field for vertical or horizontal mounting. No special tools are required.

Increased working area is a feature of the meter socket. External conduit hob openings are said to give maximum working area within the enclosure, which is made of aluminum alloy to ASTM and U. S. Government standards and finished in blue-grey baked enamel. The socket conforms also to EEI and NEMA standards.

Jaws and terminals are mounted on a heavy-duty-type insulating base. Pressure-type solderless connectors are provided. Line and load terminals will accommodate No. 1 wire; ground neutral terminal will accommodate two No. 1 wires. The unit comes in a noncircuit-closing type or automatic circuit-closing type, with or without conduit breakout in back.

Fusible Service Equipment

(2) Murray Mfg. Corp., 1250 Atlantic Ave., Brooklyn, N. Y.



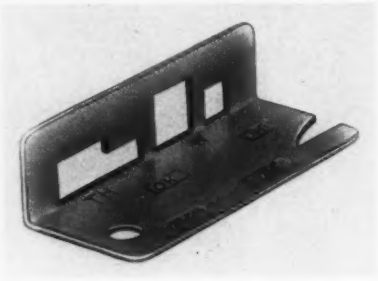
A new line of fusible service equipment has 3 or 4 pullouts and 4, 6 or 8 branch circuits. It is claimed to be particularly adaptable for handling water heaters or other equipment operating off peak. One pullout, available in 30 or 60 amp, can be isolated in a sealable compartment. The compartment barrier is removable when not required and the pullout can be used for a variety of power applications, the manufacturer states.

Known as the PJ series, the line is recommended by its manufacturer for residential, commercial and light industrial applications. In addition to the 30- or 60-amp pullout in a sealable compartment, it has a 60-amp main connected either in series or in parallel with a 60-amp range pullout. The range pullout can be used for a water pump or other applications. A fourth pullout for 30-amp applications is available. All units are offered with 4, 6 or 8 branch circuits.

Features listed include: plenty of wiring room; dead-front construction; one-piece fuse clip and blade; line and load and neutral terminals conveniently located for easy wiring; surface hook-on cover; baked-on Melamine finish.

New Gaff Gage

(3) Fargo Mfg. Co., Poughkeepsie, N. Y.



A new-type gaff gage is claimed to have greater accuracy than previous models and to eliminate much of the guess work in maintenance of linemen's climbers. According to the manufacturer, cut out accidents are reduced by more regular inspections and correct reworking of gaffs. The gage checks the gaff six ways. It is made of cold rolled steel with a polished chromium plating.

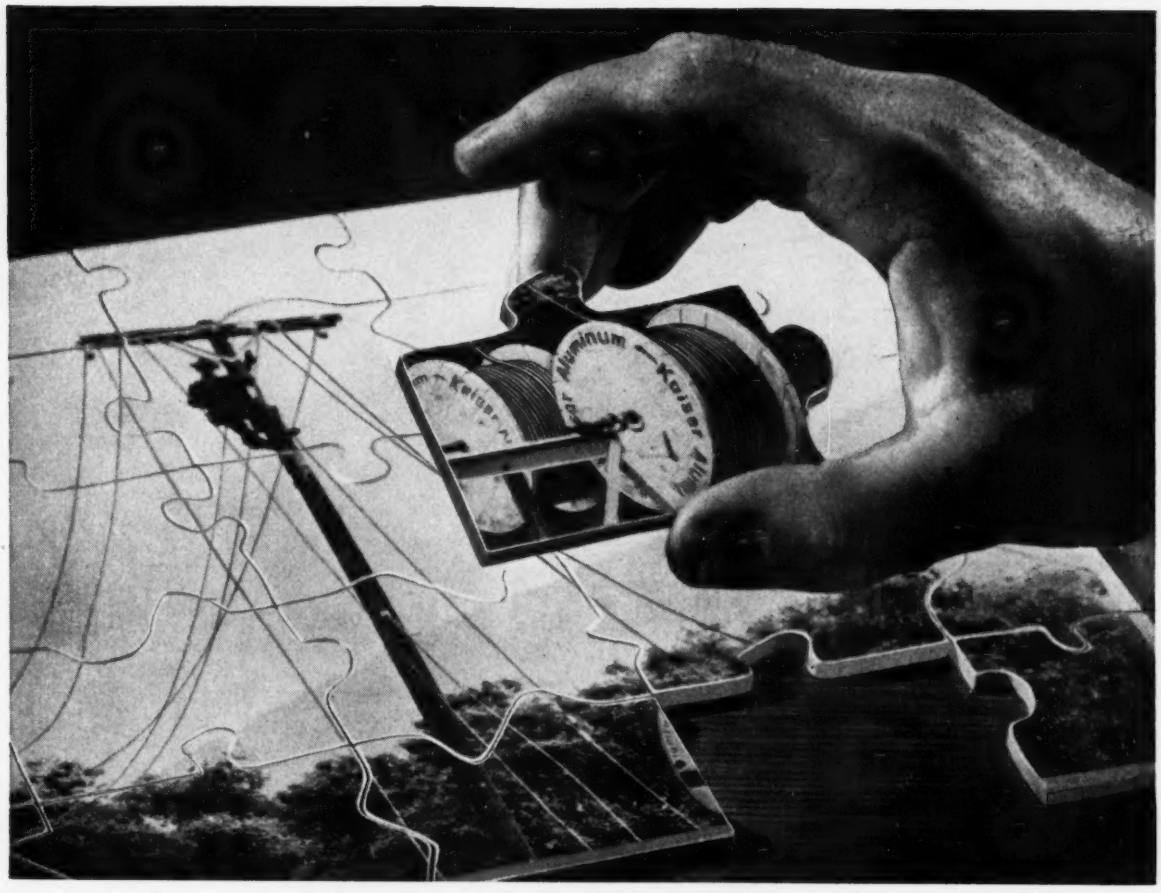
Slots into which the gaffs are inserted to check width and thickness have been cut in the short side of the L. Reference blocks stamped OK determine whether the thickness of gaff at certain points is satisfactory. Length of the gaff is checked to a reference line on the reverse side. A profile slot checks the shape of the gaff point. A small hole at the opposite end makes handling easier.

Motor-Operated Rheostat

(4) Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

Designed to adjust speed of d-c motors up to 200 hp and voltage of generators up to 300 kw, a new motor-operated field rheostat, type RK, uses snap-action limit switches. Two cam-operated switches are supplied with each unit, with additional switches available for auxiliary circuits. Each cam is adjustable over a 360° range from the front of the rheostat and comes for 15°, 45° and 90° travel.

Two different gear ratios can be supplied. One permits full rheostat travel in from 5 to 15 seconds, the other full travel in 15 to 45 seconds. Travel time may be adjusted over a 3-to-1 range by inserting resistance in the motor circuit.



How your Kaiser Aluminum conductor distributor fits into your picture

UNDER any market conditions, the *wide range of services* offered by your Kaiser Aluminum electrical conductor distributor makes him an important part of your picture.

He has available a large line of Kaiser Aluminum conductor—including the largest range of sizes and constructions of covered aluminum wire in the industry. This distributor availability gives you the benefit of *fast delivery* to help reduce your inventory.

He learns *your* problems, suggests solutions based on his specialized knowledge and years of experience handling problems *like* yours. And he makes available to you top-notch engineering services of his own and of Kaiser Aluminum.

He keeps himself—and you—up-to-date on new developments. And he gives your order friendly, personal attention, whether the job is large or small.

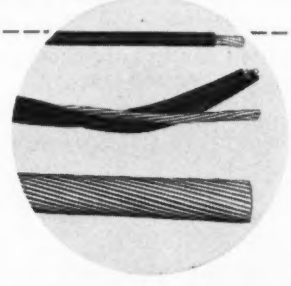
Get in touch with your nearby Kaiser Aluminum electrical conductor distributor *now*. Refer to the list below and your local telephone directory.

Kaiser Aluminum offices located in principal cities. Kaiser Aluminum & Chemical Sales, Inc., Oakland 12, California.

Kaiser Aluminum

setting the pace—in growth, quality and service

Neoprene and Polyethylene Covered Conductor, Solid and Stranded Self-Supporting Triplex Cable • ACSR • All Aluminum Conductor



KAISER ALUMINUM ELECTRICAL CONDUCTOR DISTRIBUTORS

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Line Material Company
Westinghouse Electric Supply Co.

Capital Electric Supply
Central Electric Supply Co., Inc.
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Crescent Electric Supply Co.
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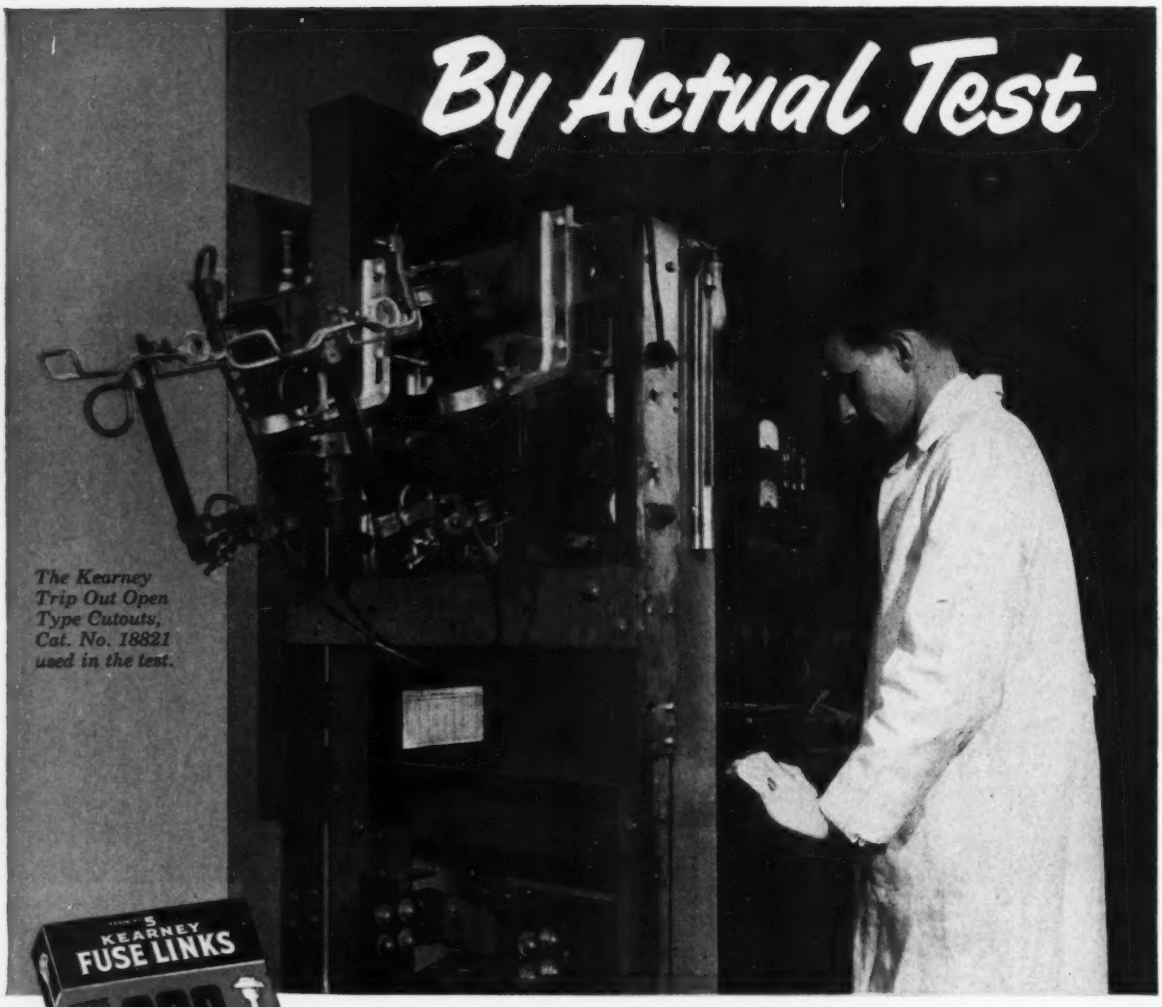
Nelson Electric Supply Company
Price Electric Company
Russell Beldon Electric Company
Stubbs Electric Company
Stuart C. Irby Company Corporation
Tafel Electric & Supply Company
The Korsmeyer Company
Virginian Electric, Inc.

By Actual Test



The Kearney Trip Out Open Type Cutouts, Cat. No. 18821 used in the test.

Another Feature

HANDY PUL-TAB FUSE PAK *Plus* COLOR IDENTIFICATION

The original Kearney protective packaging guards against fuse link damage. Individual waterproof bags prevent tangled wires, make fuse handling easy. To get the right link at the right time simply grasp the clearly marked tab and pull.

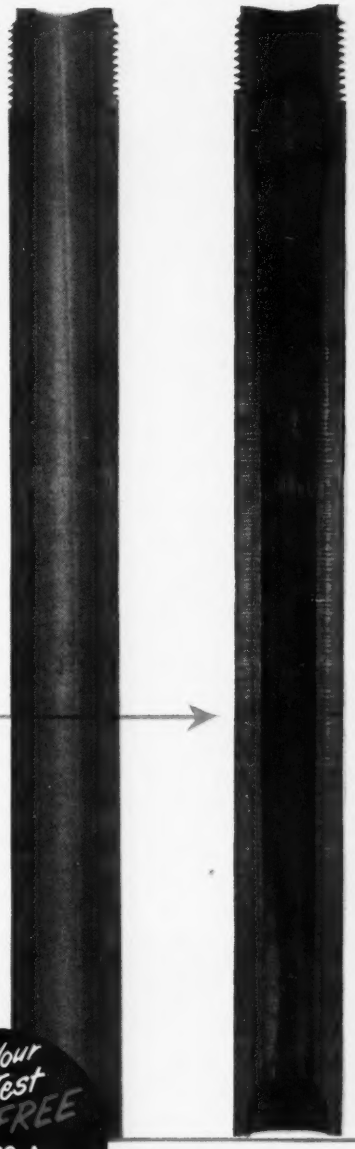
Another Kearney first, Color Identification, eliminates fuse link confusion. Each type of Kearney Fuse Link is packaged in a carton printed with its own distinct color combination. This extra feature makes identification almost automatic, prevents errors in reading labels.

Specify **KEARNEY**

KEARNEY FUSE LINKS

Prevent Fibre Damage

This simple test proves that Kearney Low Temperature Fuse Links give better system protection. Put a Kearney 100 ampere Type 200 Fuse Link in one cutout and any high temperature fuse link which has about the same continuous current carrying capacity in another. Pass 175 amperes through them for 1 hour and 50 minutes and then melt them with an increased load of 250 amperes. Now, let's look at the results.



LOW TEMPERATURE →

This unretouched photograph shows the interior of the cartridge fused with the Kearney Fuse Link. Note the absence of any charring or burning. Original arc extinguishing properties remain unchanged; cartridge could stay in service indefinitely.

HIGH TEMPERATURE →

This is the tube used with the high temperature fuse link. Look how most of its surface has been deeply burned, seriously reducing its arc extinguishing ability. This cartridge obviously should be replaced immediately.

WARNING: How many of your cutout cartridges are in this dangerous condition? If you have been using high temperature fuse links and have normal service overloads such as described above, then chances are that most of them look like the tube on the right. Remember, you can't see the damage from the outside, but the charred fibre on the inside will fail to quench the arc on the next operation. Play it safe. For reliable, low temperature system protection, switch to KEARNEY FUSE LINKS.

JAMES R. KEARNEY CORPORATION
4224-42 Clayton Ave., St. Louis 10, Mo. • Canadian Plant: Guelph, Ontario

Make Your Own Test FREE
One—100 Amp. Cat. No. 11100 Kearney Fuse Link

Gentlemen:
Send me a free 100 Amp. low temperature Kearney Fuse Link. I want to make my own test.

Name.....
Company.....
Address.....
City.....State.....
Title.....

221

MAYDWELL & HARTZELL, *INCORPORATED*
WEST COAST DISTRIBUTORS
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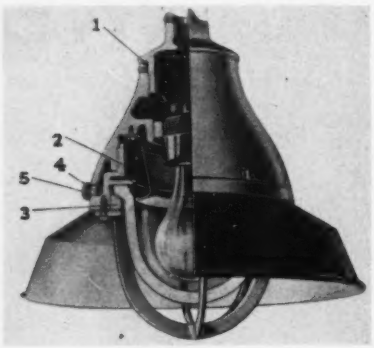
PRODUCTS

for Better Construction — Safer Maintenance

Explosion-Proof Lighting Fixture

(5) Crouse-Hinds Co., Syracuse, N. Y.



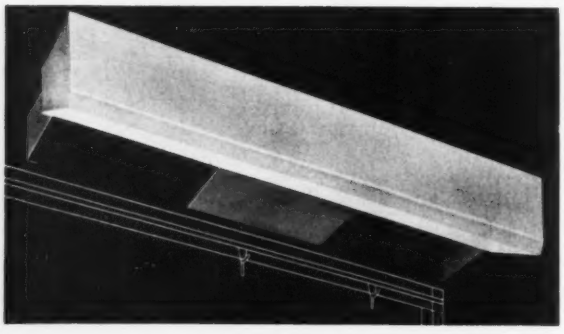
A new unit in the manufacturer's EV series, this explosion-proof lighting fixture is claimed to be easier to install and relamp because it is lighter and better sealed. In addition it is said to have 5 to 10% greater lighting efficiency than previous models.

Reason for redesigning the fixture, according to the manufacturer, was to improve its threaded connections in order to prevent liquids, vapors or dirt from entering bulb and receptacle areas. This was accomplished by three male threadings located (1) near the rim of the hood, (2) where hood and globe holders are joined and (3) where globe retaining ring and cushioning gasket are seated against the globe.

A rubber O-ring gasket (1) has been inserted above the threaded fitting at the top of the hood to seal off the receptacle compartment. One-piece assembly of globe, holder, guard and reflector is threaded high up inside of the hood (2) to prevent leakage into the lower section of the fixture.

Notches in the hood and globe holder (4) enable the globe holder to be loosened easily with a screw driver, even after it has been exposed to dirt-laden air or corrosive vapors for a prolonged period, the manufacturer states. A large knurled screw (5) sets between these notches to lock the holder into place.

All types of reflectors come in 100-, 150-, 200-, 300- or 500-w fixtures. Available for use with the new fixture are these accessories: breather; three-contact receptacle; frosted globe or half-shade.



Chalkboard Illumination

(6) Solar Light Mfg. Co., 1357 S. Jefferson St., Chicago 7, Ill.

This chalkboard lighting unit is designed to give maximum illumination from the top to the bottom, without glare. It utilizes a parabolic trough reflector placed along the top of the board, extending out from the wall. The inside of the reflector is highly polished and the outside can be painted wall color. Light from a single row of fluorescent lamps is distributed over the entire board, through angling of the reflector. The unit takes 175 w; tubes are shielded to 60° from the classroom side. The light comes from two directions, avoiding hand shadow. Lamp and reflector are so arranged that direct rays of the lamp illuminate the top of the board and the maximum output of the reflector is directed to the bottom of the board. Size of the specular aluminum parabolic reflector is designed to amplify the bare lamp candlepower by about five times in the direction of the axis of the parabola, the manufacturer points out.

Trailer-Mounted Chipper

(7) Stemm Bros., 14th & Commercial St., Leavenworth, Wash.

The Hi-Tender model No. 9 has a 9-in. cutterhead, with speed of approximately 1,500 rpm, and four 9-in. blades; V-belt drive and belt tightening adjustment. Limb capacity is 6 in. maximum. Other chipper features are wedge-type positive blade locks and cutterhead braking lock.

Engine is 4-cylinder 45-hp Ford Industrial, or equal, with clutch, radiator, generator, starter, dustproof ignition, 6-v, 40-amp generator, battery, governor.

Trailer is 84 in. long, 66 in. wide over-all. It has 16-gage steel fenders with supports. Linco axle coil spring capacity is 3,000 lb; track, 72 in. Brakes are optional; tires, 600x16, 6 ply, h.d. Other features: safety chains provided, ball-type hitch with crank stand, rear-end stabilizing jack, adequate lights and reflectors.

Two chutes, one for scattering at roadside and one for truck loading, are provided. The unit weighs about 2,500 lb.

Flexible Conduit for Wet Locations

(8) American Brass Co., 698 S. Main St., Waterbury, Conn.

Sealtite flexible electrical conduit, type UA, has UL approval for use in wet locations. This liquid-tight flexible metal conduit has a tough, extruded synthetic covering over its core to protect wiring against moisture, oil, dirt, chemicals and corrosive fumes, on both permanent and temporary installations. The conduit is made of spirally wound, interlocked zinc-plated steel strip with a copper bonding conductor wound spirally in the space between each convolution on the inside. Comes in long lengths in nominal electrical ID sizes 3/8 to 1¼ in.; can be cut to required lengths; bends easily. UL approved fittings are readily available, the manufacturer states.

NIKOH

it's here! | *colorline* E.M.T.

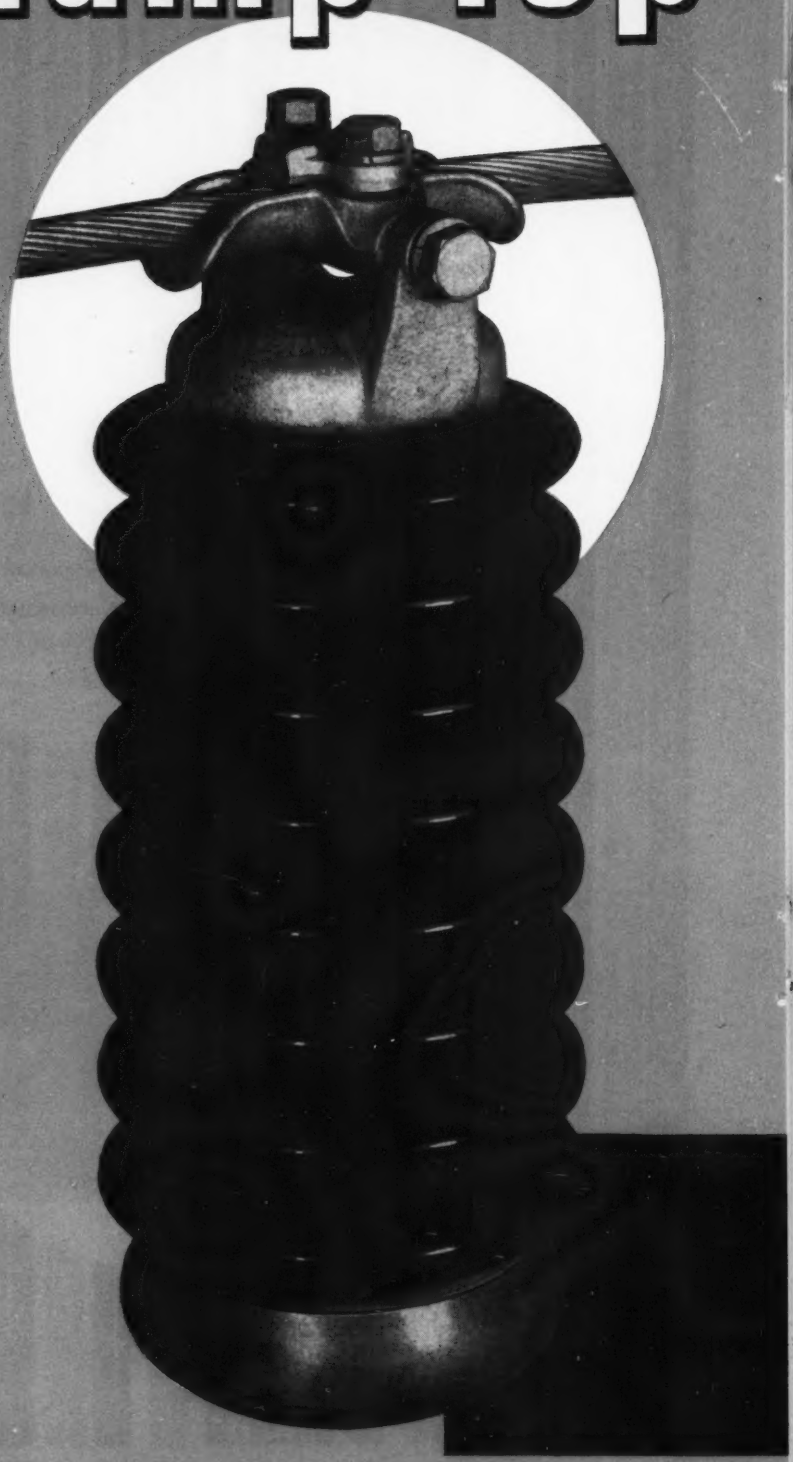
Raceway becomes traceway.
See it...bend it...test it yourself!
Electricians asked for it...
NIKOH developed it.

See Nikoh *colorline* E.M.T. at
the N. A. E. D. Convention — Booth No. 13
May 24 to 29 — The Conrad Hilton — Chicago
or call your Nikoh distributor
or sales representative.

NIKOH TUBE COMPANY
5000 S. WHIPPLE ST., CHICAGO 32, ILLINOIS
GROVEHILL 6-6500

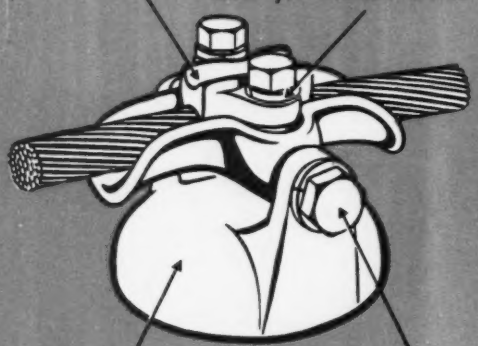
Lapp announces

Clamp-Top



Reversible keepers—and four sizes of clamps (interchangeable on all sizes of insulators) —provide correct fit for all conductor sizes .25" to 1.50".

Captive lock-washers on clamp cap screws; only one loose part for conductor installation. Greatest convenience for hot-line work!

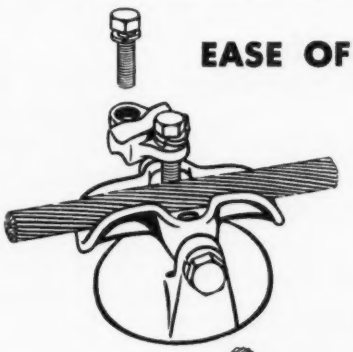


Trunnion cap screw serves as one end of trunnion bearing. Backing-off (without removal) disengages clamp which remains attached to conductor.

Metal cap cemented to outside of porcelain head. External hardware attachment protects porcelain from internal bursting forces.

Line Post

For those who feel that the advantages of clamp-top line insulators outweigh their disadvantages*, Lapp offers its Line Post insulator with a new Lapp-engineered clamp-top. In this unit is a simplicity of design which makes for greatest ease and low cost in original installation . . . maximum security and convenience in hot-line changing of insulators . . . and all the safety and mechanical dependability of Lapp Post construction.



EASE OF INSTALLATION

In making the original installation, the Line Post, with clamp attached, is mounted on the crossarm (interchangeable stud bolts provide for mounting on any type of crossarm). Keeper cap screws are loosened, and one removed; the loose keeper is rotated—on the remaining cap screw—out of position. The conductor is then dropped into place, the keeper brought back into position, cap screw replaced, and both cap screws tightened. Cap screws have captive lock-washers, so there is *only one loose part* per insulator throughout installation.

CONVENIENCE OF INSULATOR CHANGE

To change out an insulator, the trunnion cap screw is backed off *(not removed)*, and conductor (with clamp still attached) lifted out of position. The insulator is changed, conductor and clamp slipped into position in the new insulator, and held by tightening trunnion cap screw. *No loose parts* throughout insulator change.

SAFETY AND MECHANICAL SECURITY

A fundamental concept of all Lapp Post design is external attachment of hardware. The clamp-top assembly is carried on a cap cemented onto the outside of the head of the porcelain post. This provides for loading of the porcelain only in compression. Elimination of bursting internal forces protects and safeguards porcelain life.

Lapp

** Lapp has repeatedly pointed out the merits of tie-wire attachment of conductors. As it has been used for many years, the simple tie-wire provides a sort of mechanical fuse or "weak link"—in case of a broken conductor, the conductor will slip through the tie-wire, to relieve crossarms and poles of excess load. The clamp-top insulator has the basic disadvantage of positive attachment to conductor —in case of a broken conductor, structure damage is almost certain.*

Write for specification data on clamp-top Lapp Line Posts at ratings 20 kv to 88 kv.
Lapp Insulator Co., Inc., Le Roy, N. Y.

Type ARTC Explosion-Proof Tumbler Switch Unilet. Made of unbreakable MALLEABLE IRON, light and strong.

Protect all Hazardous Locations with APPLETON EXPLOSION-PROOF EQUIPMENT

AA-51 Series Vented Type Explosion-Proof lighting fixture. Cooler operating ... easier to service.

It's a comfortable feeling to know that all hazardous locations in your plant have Appleton *positive protection* against fire or explosion from electrical causes.

Appleton Explosion-Proof Equipment *confines* all short circuits, switch arcs, flames or explosions *within* the switch box, conduit fitting or fixture. All threaded connections have five full threads to imprison flames or arcs, and to cool escaping gases after an internal explosion has occurred. Flat joints at cover openings are accurately machined for flame-tightness, and have extra screws for added strength.

Unbreakable malleable iron gives extra strength and lightness. Appleton Explosion-Proof fittings withstand at least *four times* the maximum possible internal pressures without bursting or loosening screws or joints.

All Appleton Explosion-Proof Equipment meets the requirements of Class I, Groups C and D, hazardous locations. Write for details.

Type EFU Explosion-Proof fluorescent lighting fixture. Available for two 40 Watt, 48" lamps; or two 100 Watt, 60" lamps.

Type FSQX Explosion-Proof and Dust-Tight plug and receptacle with interlocking safety switch.

APPLETON MALLEABLE -IRON- UNILETS

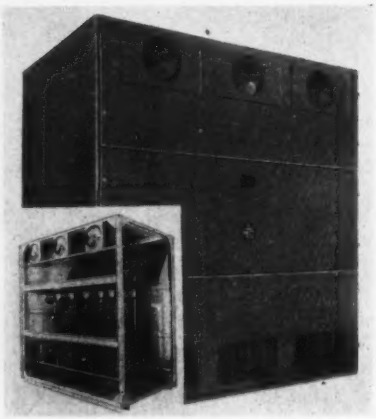
Sold Through Electrical Wholesalers

APPLETON ELECTRIC COMPANY

1709 Wellington Avenue • Chicago 13, Illinois

CONDUIT FITTINGS • LIGHTING EQUIPMENT • OUTLET AND SWITCH BOXES • EXPLOSION-PROOF FITTINGS • REELITES

Sales Engineers in All Principal Markets



Dual-Rated Transformer

(9) Marcus Transformer Co., Hillside, N. J.

A new dual-rated dry-type heatproof insulated transformer is claimed to take overloads for much longer periods. It is double rated because of blowers mounted in the housing and a thermostat located in the coils. One rating covers its operation without the blowers functioning, when the transformer is naturally cooled. When heat reaches a certain level the thermostat activates the blowers and this provides forced-air cooling that automatically increases the transformer's rating by 33⅓%. Baffles in the housing direct the moving air over and through the coils. Air vents are located front and rear, top and bottom. Unit comes in ratings from 100 to 3,000 kva in voltages to 15,000 v.

Noise-Stop Baffles

(10) Owens-Corning Fiberglas Corp., Toledo 1, Ohio

Sound-absorbing noncombustible baffles for hanging where a conventional acoustical ceiling is impractical because of obstructions are made of fine fibers of glass bonded with a thermosetting binder into a rigid panel, 24 in. wide, 48 in. long and 1½ in. thick. The baffle is enclosed in an opaque plastic film. Stainless steel wires, inserted through the board, are formed into a hook at the top and secured to the top and bottom of the baffle with stainless steel saddles. This acoustical treatment absorbs the sound that would normally strike the unyielding surface of the ceiling and bounce back to the working area, the manufacturer points out.

For more data fill in coupon on page 66

Over 200,000 feet of SPANG® EMT thin wall conduit with the SPANGLEAM finish installed in Miami Housing Project

The damp, salty atmosphere and year-around high temperatures of Southern Florida climate place high requirements on the type of EMT thin wall conduit used in construction of new homes and buildings.

For this reason, 205,000 feet of Spang's new EMT thin wall conduit with the SPANGLEAM finish was chosen for use in wiring the new 350-unit housing project at Miami, Florida . . . because the new SPANGLEAM finish, inside and out, assures high corrosion resistance and years of service life.

Specially finished inside with a protective coating of resinous lacquer compounded with Zirconium, SPANGLEAM provides easier wire pulling, assured grounding and corrosion resistance.

Spang top-quality EMT conduit is easy to cut, bend and install . . . it's cleaner, easier to handle, easier to maintain. Ask *any* electrical contractor . . . he'll tell you *why* SPANG EMT thin wall conduit is better!

Spang EMT with the SPANGLEAM finish is available *at no extra cost* immediately in a full range of sizes from ½ inch to 2 inches. See your distributor today—ask for SPANGLEAM.

Owner and General Contractor:
Ricmar Builders, Inc.

Architect:
Thomas J. Madden, Jr.

Electrical Contractor:
Tri-City Electric Company, Inc.

SPANG CONDUIT

SPANG-CHALFANT
Division of The National Supply Company
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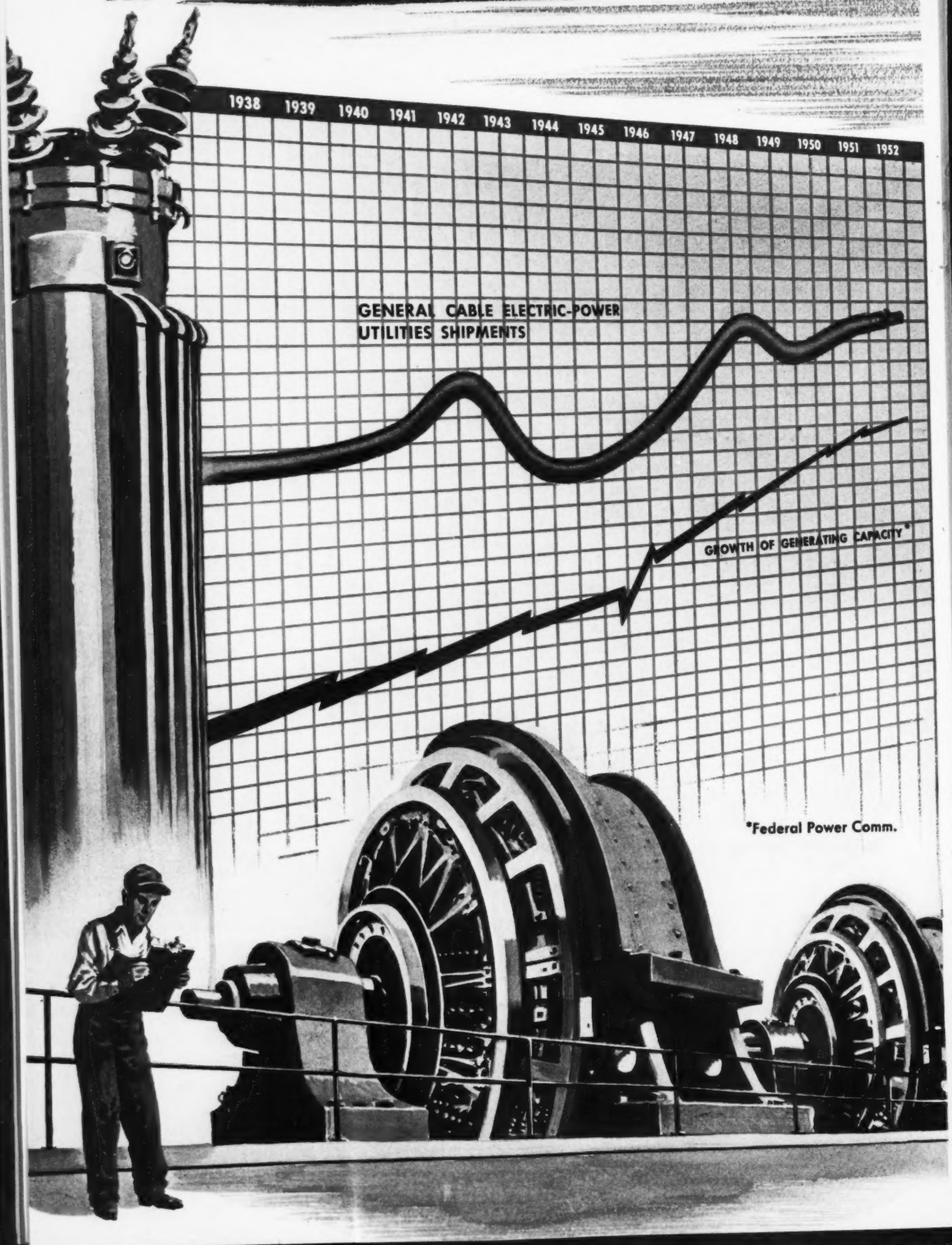
AS GENERATING CAPACITY CONTINUES



TO EXPAND . . .

GENERAL CABLE

Continues to Grow ...and Serve

General Cable, like the utility industry itself, is geared to forecast trends and growth possibilities so that it may always be counted on as a dependable, progressive source of supply. Offering thousands of different wire and cable products of one standard of quality, General Cable's strategically located plants, warehouses and sales offices insure adequate supplies with swift service for every part of the country. We always have and will maintain this policy as power output demands.

For sure, dependable supply, call General Cable!

"More Power to You"®

GENERAL CABLE
CORPORATION

EXECUTIVE OFFICE: 420 LEXINGTON AVENUE, NEW YORK 17, NEW YORK • SALES OFFICES IN PRINCIPAL CITIES OF THE UNITED STATES

SHAWMUT'S NEW FORM 208 Amp-trap®

SAVES BOTH CIRCUIT AND CUSTOMER
(FOR 120/208 VOLT AC OR 125/250 VOLT DC NETWORKS)

POSITIVE PROTECTION AGAINST SUPERCURRENTS

Low voltage AC and DC networks give large utilities and their customers greater continuity of service and easy expansion of their systems. The only drawback to this type of network is the constant threat of danger from heavy short-circuit or fault currents. Shawmut's new FORM 208 Amp-trap eliminates this danger from these circuits. On actual test, its amazingly fast "chop-off" stops a short-circuit *even before it reaches the peak of its first ¼ cycle — even if the available peak current could reach* 560,000 *Amps!* It anticipates and prevents the destructive build-up of heavy fault currents so dangerous to office buildings, stores, hospitals, theatres, schools, etc. FORM 208 saves *both* circuit and customers.

USES & SPECIFICATIONS

Amp-trap FORM 208 is made for Entrance Switch Service, Underground Network Conductors, Distribution & Panelboards and other applications. It is built in Ampere ratings of 1000, 1200, 1600, 2000, 2500, 3000, 4000 and 5000 for Entrance Switch Service and for cable sizes from 4/0 to 1000 MCM. It runs "cool" and carries 100% of its rating with temperature rises less than those recommended in the Underwriters' Laboratories Standards for Fuses. The watt (power) loss is probably lower than for *any other over-current protective device.* Hence it may safely be installed in vaults and steel enclosures and subjected to long continued loads.

LOW IN COST— EASY TO INSTALL

FORM 208 Amp-traps clear fault currents long before they can burn or wreck bus bars and switch gear. Yet they are small in size, low in cost and easy to apply. They have a variety of mountings for flat, bus or tubular connectors. Adapters can be supplied for switch cubicles now equipped with copper or aluminum alloy links. FORM 208 is the "little brother" of the famous FORM 600 Amp-trap which has long been used so successfully on 600 volt circuits. Write today and find out about FORM 208 at once.

208
WITH TUBULAR TERMINALS

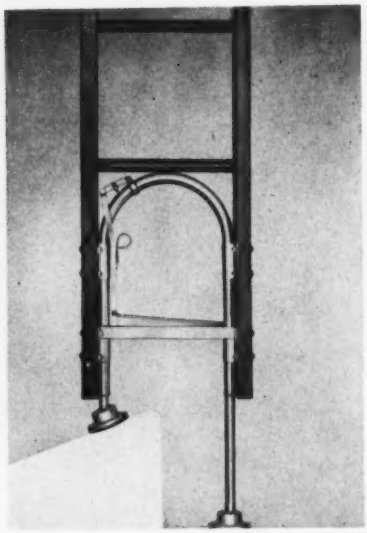
Copyright 1953 The Chase-Shawmut Co.

OUR 60th YEAR — FROM EDISON TO ELECTRONICS

208 AMP-TRAP — "Awake At The Switch"

THE CHASE-SHAWMUT CO.

385 MERRIMAC STREET • NEWBURYPORT, MASSACHUSETTS



Ladder Leveling Device

(11) A. B. Chance Co., Centralia, Mo.

Called the Ladr-Levl, this safety device adjusts to any surface, leveling the ladder without shoring. A spacer coil spring controls the telescoping legs, compensating to fit the contour of the ground. As the workman first steps on the cross bar of the device, his weight moves a lock pin between the spring and automatically locks the legs in place. It must be unlocked manually.

Heavy rubber concentric ring feet cling to wet or dry surfaces, the manufacturer states. The unit may be installed on either a straight or tapered ladder by removing the bottom rung and bolting device to the side rails. Units come for ladders with rung lengths from 12 to 28 in.

Digger

(12) Eugene John Freeman & Co., P. O. Box 2143, Van Nuys, Calif.

A lightweight, portable one-man operated digger, called the Hole-A-Minit, will dig holes ranging from 4 to 11 in. in diameter up to 6 ft deep. On model 636 S, a shaft extension allows digging beyond the 6-ft depth. The tool can be used for digging post holes or in installing or repairing wires. It can be used in remote locations with 1- to 2-kw portable field generators and it will drill at any angle in hard or soft earth or shale, the manufacturer states. All models operate with any air drill equipped with standard Jacobs chuck or with a half inch or larger electric drill rated at 500 rpm or less, 7 amp or more.

"JOB PROVEN" THE WORLD OVER Nicopress

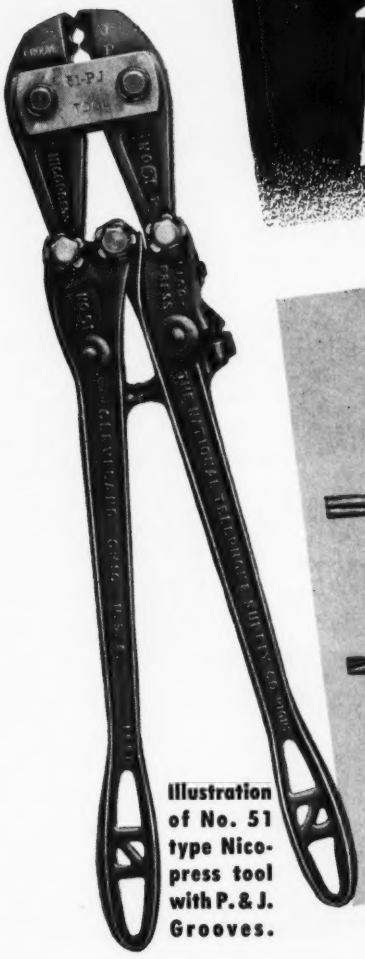
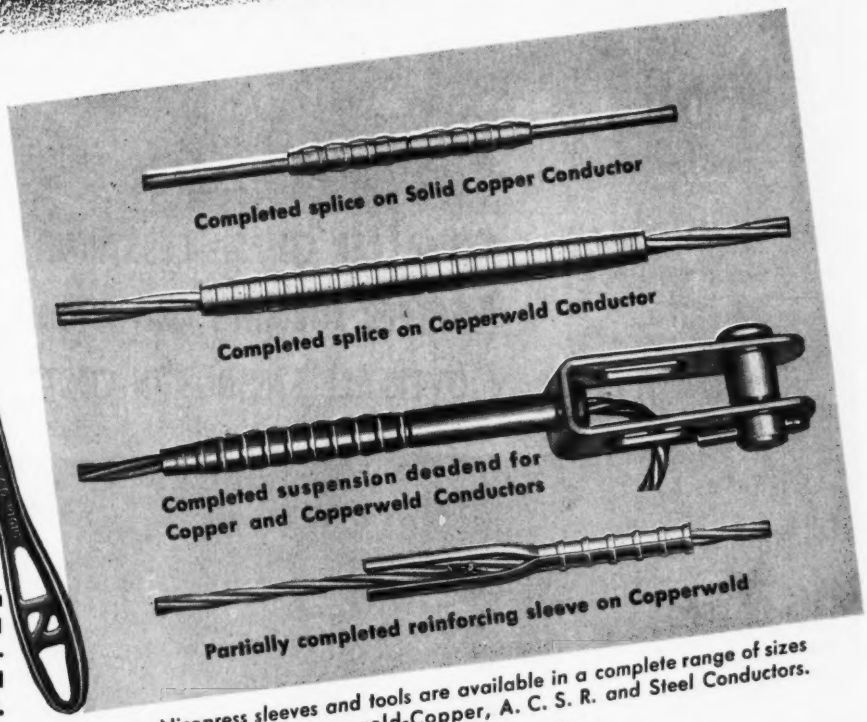


Illustration of No. 51 type Nicopress tool with P. & J. Grooves.


Completed splice on Solid Copper Conductor
Completed splice on Copperweld Conductor
Completed suspension deadend for Copper and Copperweld Conductors
Partially completed reinforcing sleeve on Copperweld

Nicopress sleeves and tools are available in a complete range of sizes for Copper, Copperweld-Copper, A. C. S. R. and Steel Conductors.

Nicopress

is the Registered Trade Mark of The National Telephone Supply Company

The National Telephone Supply Company

5100 SUPERIOR AVENUE • CLEVELAND 3, OHIO

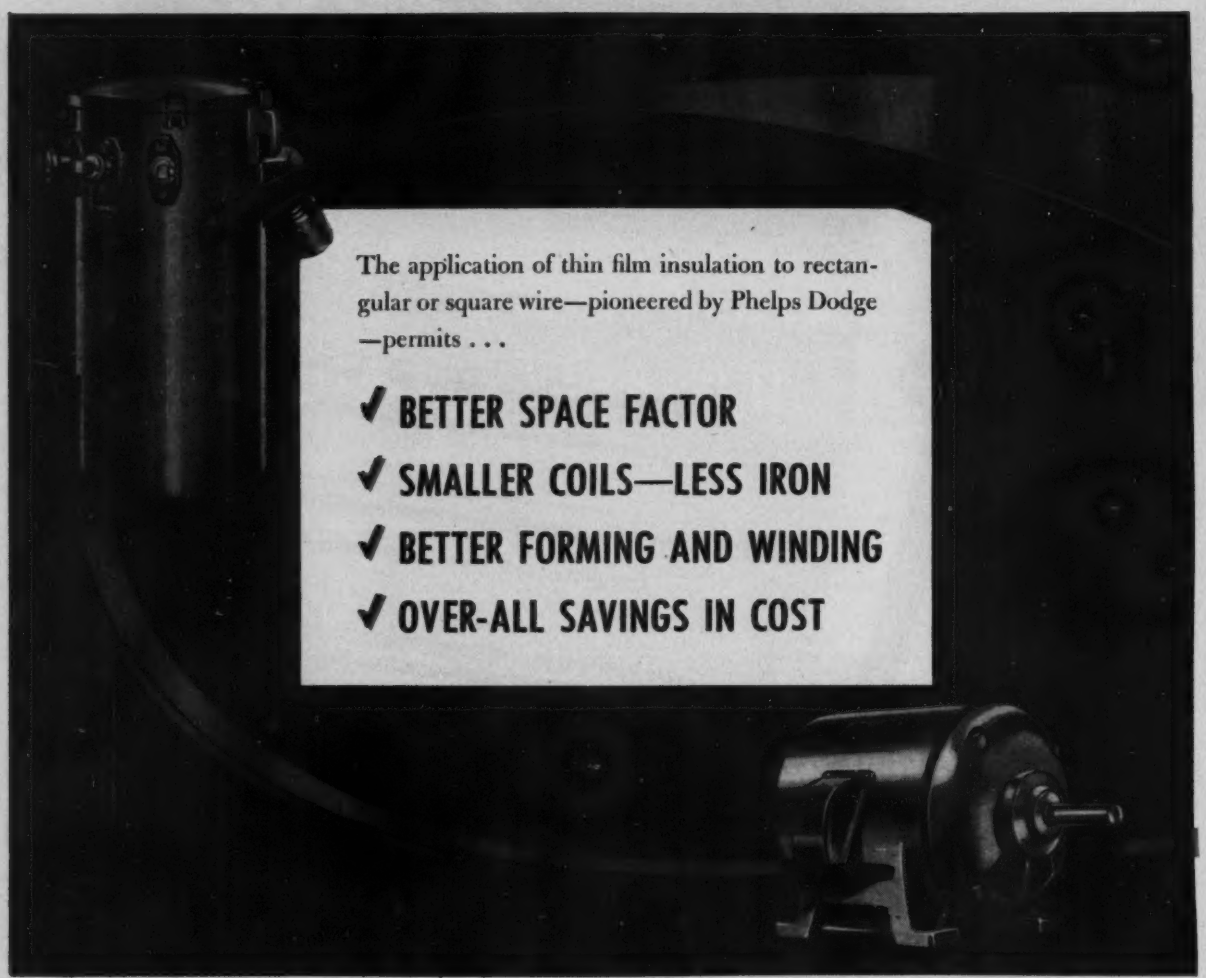
Canadian Mfrs.—N. SLATER CO., LTD., HAMILTON, ONT., CANADA

Export Distributor—INTERNATIONAL STANDARD ELECTRIC CORP., NEW YORK, N. Y.

THE NATIONAL TELEPHONE SUPPLY COMPANY

Phelps Dodge Rectangular

SAVE SPACE—IMPROVE

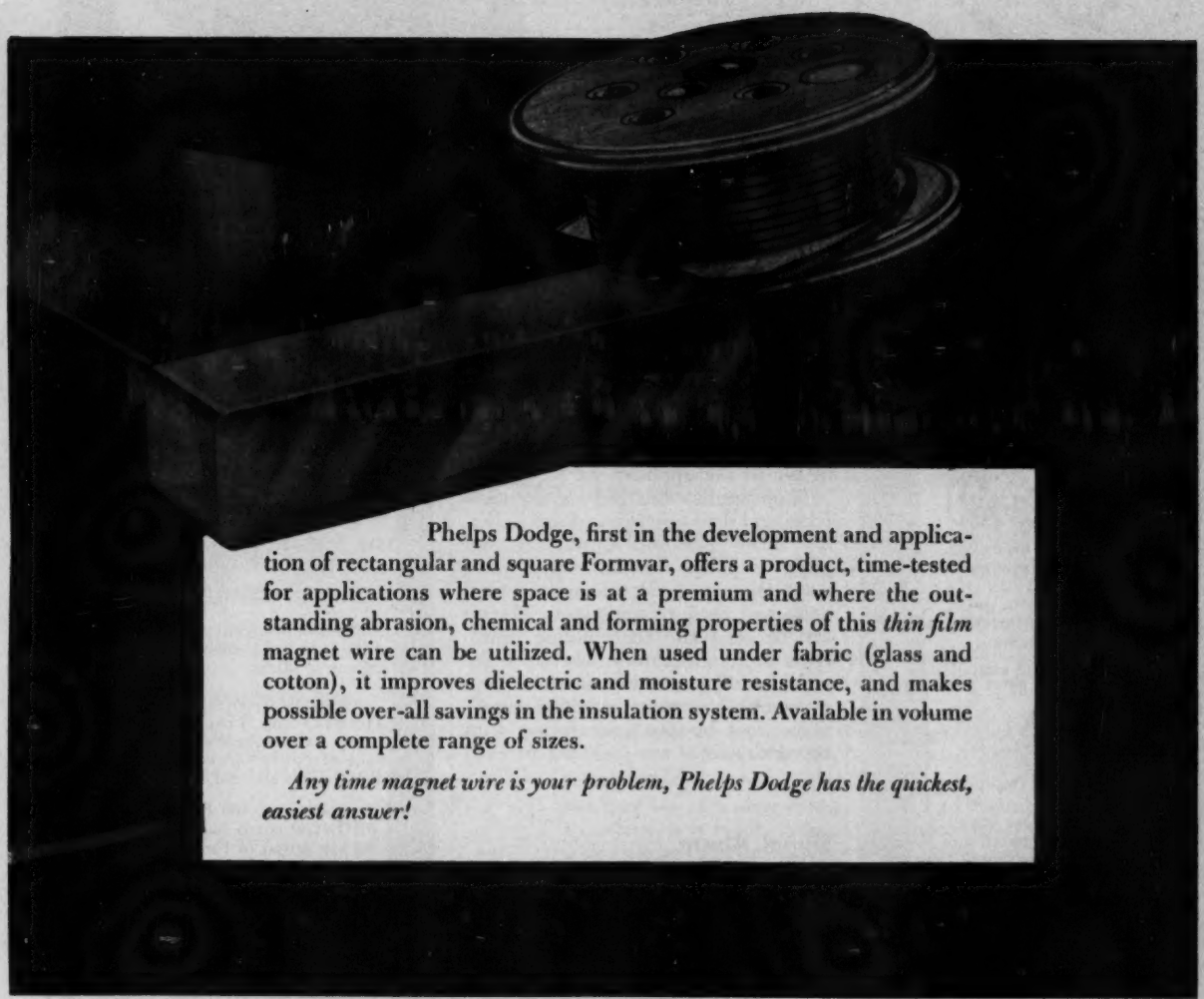

The application of thin film insulation to rectangular or square wire—pioneered by Phelps Dodge —permits . . .
✓ BETTER SPACE FACTOR
✓ SMALLER COILS—LESS IRON
✓ BETTER FORMING AND WINDING
✓ OVER-ALL SAVINGS IN COST

"It takes the best

PHELPS DODGE COPPER PRODUCTS

CORPORATION

or Square Formvar Helps You
DESIGN AND EFFICIENCY



Phelps Dodge, first in the development and application of rectangular and square Formvar, offers a product, time-tested for applications where space is at a premium and where the outstanding abrasion, chemical and forming properties of this *thin film* magnet wire can be utilized. When used under fabric (glass and cotton), it improves dielectric and moisture resistance, and makes possible over-all savings in the insulation system. Available in volume over a complete range of sizes.

Any time magnet wire is your problem, Phelps Dodge has the quickest, easiest answer!

to make the best!"

INCA MANUFACTURING DIVISION

FORT WAYNE. INDIANA

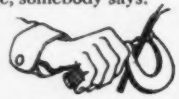
"What Is It?"

"What kind of [illegible]nkety-blank wire is this, anyway?

"We took this [illegible]il off a job some time ago, stuck i[illegible]n the store room, and now we wa[illegible]to use it again.

"But is it heav[illegible]enough to carry the load?"

"Send it down to Engineering to have somebody figure the wire gauge, somebody says.

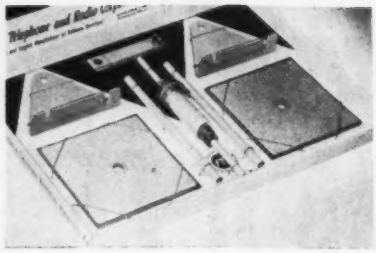


"Great. Gotta be miked. Gotta look up the current-carrying capacity in a handbook. Gotta get it delivered back to me. Very practical suggestion . . .

"And then, what kind of jacket has it got?

"I suppose now somebody is going to tell me to send it out to a chemical laboratory to get it analyzed.

"Not me. I'm going to sit right down and write . . .



Selenium Rectifier Kit

(13) Federal Telephone & Radio Corp., Clifton, N. J.

A build-your-own selenium rectifier kit that enables the assembly of a range of selenium rectifier stacks at reduced costs is designed for radio hams and hobbyists, service repairmen and electrical technicians.

The compact, self-contained unit has all the necessary components for assembling any one of four types of selenium rectifiers; half wave; full wave center tap; full wave bridge type and full-wave battery charger. The rectifiers can be assembled quickly, disassembled easily and the parts used to produce other rectifier types, the manufacturer states. Sufficient components are available to build any one of 12 rectifier stacks for use in a wide range of a-c to d-c applications.

Shop applications include the servicing and demonstration of car radios, d-c office machine conversion and power supplies for d-c motor speed controls, relays, electromagnets, solenoids and similar components. The kit can be used also for building prototypes in the laboratory, where the desired rectifiers can be assembled and reassembled to meet modified conditions. Step-by-step instructions with keyed drawings are included in each kit.

Signal Alarm

(14) Russell & Stoll Co. Inc., 125 Barclay St., New York, N. Y.

Monolarm, a new signal alarm unit designed for modern flow line and graphic panels, is said to take up a minimum of space on panelboard because of its narrow bezel and compact box.

Other advantages claimed for Class 1, Group C and C, Division 2 operation: lighting indications in two or three colors on one bezel; quick relamping; instantaneous power supply connect and disconnect; safety features; easily removable hermetically sealed plug-relays; time delay circuit to counteract turbulence and vibration when abnormal condition is reached. Details in sales data sheet 21253 10 P.

"No Question ABOUT TYPE OR SIZE"

The tough 60% *by weight* Neoprene protecting jacket on all

BRONCO 60 Certified

portable cords and cables is **BRANDED** with

THE NAME—BRONCO 60 NEOPRENE *CERTIFIED*...

THE TYPE—SO, W, G, or WELDING CABLE . . . .

NUMBER OF CONDUCTORS—1, 2, 3, 4, 5, 6, 7, 8 . . .

THE SIZE—18, 16, 14, 12, 10, 8, 6, 4, 2, 1, 1/0, 2/0, 3/0, or 4/0

VOLTAGE—300V, 600V, etc.

P116BM—approved number of the U.S. and Pennsylvania Bureau of Mines.

SELF-MEASURING!

The branding is repeated every two feet. Want 20 feet of cable? Count 10 BRONCO's and cut.

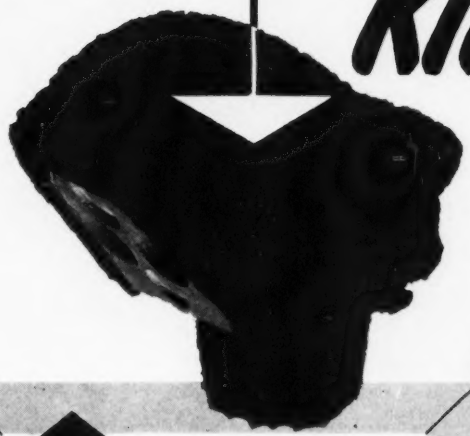
Furthermore, we brand BRONCO cords because we are proud of the way they perform. Years from now we want you to be able to identify the cord or cable that has delivered such outstanding continuous service.

WESTERN

WESTERN INSULATED WIRE CO.
LOS ANGELES 58, CALIFORNIA

RUST NEVER RESTS

KILLARK NEVER RUSTS



The "Red" enemy has taken his toll again. After ten years, exposure to a humid climate, this iron fitting displays all the signs of "rust-torture"—pitting, scaling, structural breakdown... signs of costly installation troubles in the near future.

Ten years—or twenty years—from now, this Killark Alumalloy fitting will still be offering safe, sure day-after-day service. Its smooth clear-through Alumalloy construction is mute testimony to the decades of reliable performance that lie ahead for every Killark installation.

install permanently with KILLARK Alumalloy Fittings and Fixtures

Killark Alumalloy Fittings Meet Government Specifications

They'll Never Rust . . . Never Corrode!

Night and day rust is busy eating away at ordinary electrical installations—devouring years of future performance, consuming profits, creating costly breakdowns and lost time.

But Rust's relentless appetite can't harm Killark Fittings. They're made of exclusive Alumalloy—the 20th Century Metal. They can't rust—they won't corrode.

And there are many other *shining* examples of Killark superiority. For example: Alumalloy is satin-smooth inside and out... won't break under excessive strain... is safe and non-sparking... 60% lighter than iron... always produces a clean-cut, easy-to-install thread.

K KILLARK ST. LOUIS Killark

"KILLARK—a Fitting Name to Remember"

ELECTRIC MANUFACTURING COMPANY

Vandeventer and Easton Aves. St. Louis 13, Missouri

SALES OFFICES and WAREHOUSE STOCKS	Atlanta	69 Mills Street, N. W.	Dallas	1901 Griffin Street	Philadelphia	2014 Chancellor St.
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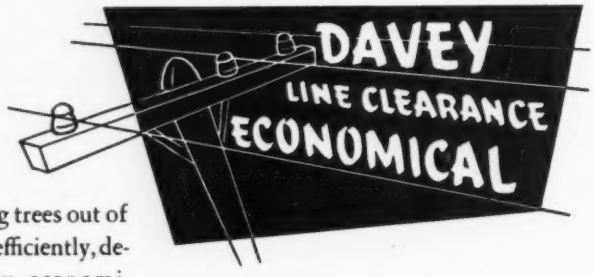
Unmatched EQUIPMENT
Davey TRAINING
Proven RESPONSIBILITY make...



Keeping trees out of wires...efficiently, dependably, economically, in a manner that builds goodwill for the Utilities... that's the responsibility Davey Line Clearance is enjoying today in serving private Utilities from border to border. Davey craftsmen are thoroughly trained, ably supervised. Davey specialized equipment is unmatched. For efficiency, economy and safety in Line Clearance—call Davey.

DAVEY TREE SURGERY CO., INC.
of California

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Russ Bldg.

Los Angeles
Story Bldg.

FRESNO
SACRAMENTO
SAN DIEGO
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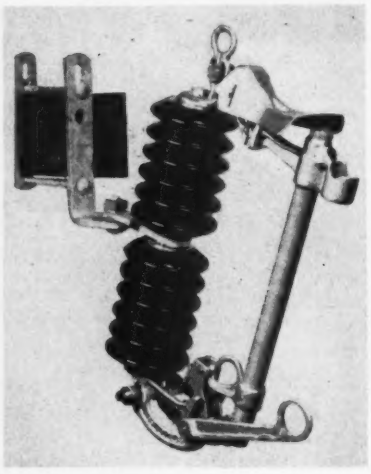


Load Break Switch Cutout

(15) Southern States Equipment Corp., Hampton, Ga.

Type L-33-D dropout cutout gives full load break operation up to its continuous current rating of 100 amp. By pulling the lever arm wtih a hookstick, the fuse link is broken within the tube causing the fuse to operate as under moderate fault conditions.

The cutout features the principle of controlled venting that allows gases created under heavy fault conditions to escape in opposite directions at both ends of the fuse tube. This gives a higher interrupting capacity for a given size tube. Under low or moderate faults, gases vent at the bottom of the tube only.

A conventional universal button head fuse link is required. The cutouts come in 5, 7.5 and 15 kv and in continuous current ratings of 100 amp and in interrupting ratings of 2,500 and 4,000 rms amp.

Receptacle

(16) Slater Electric & Mfg. Co. Inc., 56th St. & 37th Ave., Woodside, N. Y.

A 15-amp 125-v combination three-two-wire grounding duplex receptacle is designed to accommodate at either end both three-wire tangential-bladed grounding caps and conventional two-wire parallel-bladed caps. This No. 326 is UL approved; is adaptable to d-c circuits because of its polarized parallel entrance; has grounding terminal permanently connected to the mounting strap; comes in both brown and ivory. Catalog sheet 326 gives details.

For more data fill in coupon on page 66

Hold That Line!

with the HUBBARD 4-11-44 Wireholder

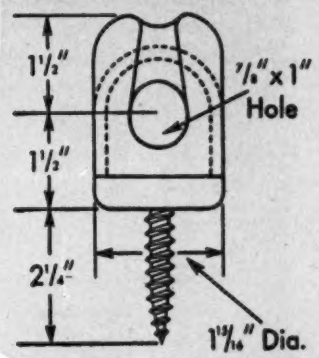
Smoothly rounded insulator surfaces protect insulation from damage.
Copperweld bail takes all the tension, porcelain subjected to compression only.
HUBBARD
Heavy steel base is double-dip hot galvanized to withstand corrosion through the years.
Thread is cut clear to base, for maximum holding power in thin material.
Sharp-pointed wood screw starts easily, the threads cut deep and clean.

The Hubbard 4-11-44 is the Wireholder:

- That is holding more lines than any other wireholder made.
- That holds the speed record for quick installation.
- That has a screw with the sharpest, keenest cutting threads.
- That gets the best possible grip in thin material.
- That is designed so that the Copperweld Bail takes the tension load.
- That exposes the porcelain to compression loading only.
- That is designed with smooth, large-radius insulator contours to protect insulation.

The same features are available with wood screw lengths from 2¼ to 7½-inches, and with toggle, carriage, or stud bolts. See GESCO Catalog 102WP page 911.

DETAIL DIMENSIONS



GENERAL ELECTRIC SUPPLY COMPANY

A DIVISION OF GENERAL ELECTRIC DISTRIBUTING CORPORATION

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CALIFORNIA

EARTHQUAKE

PROVES ADVANTAGES OF

KNOB & TUBE WIRING

Earthquakes only serve to **emphasize** the many advantages of Knob and Tube Wiring. In a recent California earthquake a large new building had to be closed because of damage to the wiring system. In contrast inspectors reported old knob and tube wiring, which was some of the oldest in the state and located in the hottest attics, survived without causing a single fire or other damage. Inspectors, Contractors, Engineers and Code have long recognized the superiority of Knob and Tube Wiring in safety, in load carrying capacity and economy. Knob and Tube Wiring with plenty of copper is **the** answer to the need for adequate wiring. Your nearest Porcelain Products west coast representative listed below will be glad to supply further information

WESTERN REPRESENTATIVES

LOS ANGELES . . . **Allied Industries**
412 Seaton Street

SAN FRANCISCO . **Geo. A. Gray Company**
2720 - 17th Street

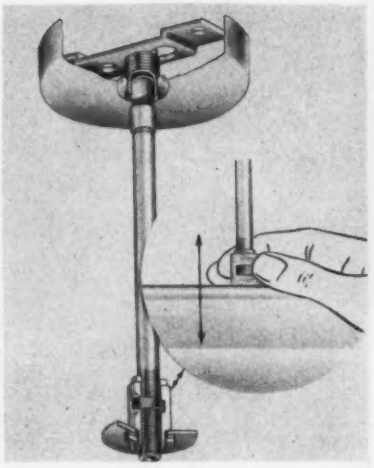
SEATTLE . . . . . **Mr. E. A. Will**
534 First Ave., South

SALT LAKE CITY . . **Mr. Leonard M. Slusser**
318 Dooly Block

ALBUQUERQUE . . **Gordon W. Laursen & Son**
512 W. Granite

DENVER . . . . . **Harvey M. Olmstead Co.**
3755 Blake Street

Porcelain Products, Inc.
FINDLAY, OHIO



Lighting Fixture Hanger

(17) The Miller Co., Meriden, Conn.

A stem-winder leveling device and a 25° swivel are features of a new-type lighting fixture hanger designed to permit fixtures to be leveled after installation without tools. According to the manufacturer, no cutting or rethreading of stems is necessary. The device comes complete with hickey and crossbar for outlet box ears or stud.

Floodlight

(18) Crouse-Hinds Co., Syracuse 10, N. Y.

The RLEE-14 is a 500-w heavy-duty explosionproof floodlight. In addition to more than doubling illuminating power of previous models, the new fixture includes protective features that keep it operating safely and efficiently while exposed to explosive or flammable gases, the manufacturer points out.

It has a heavy, tempered and impact-resisting lens as well as a separate explosionproof wiring compartment in its base that is isolated from the lamp compartment by an explosionproof seal. Other features include Alzak aluminum reflector, easy access for relamping and focusing from the rear and degree-marked aiming quadrants.

Conduit or the manufacturer's type EC explosionproof flexible couplings are available in any required length for use with the floodlight.

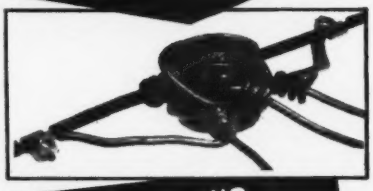
For manufacturers' bulletins with additional information on these products, fill in coupon on page 66

Four-In-One SPOOLS

For multiple service • take-offs

No. 11357-B with reinforcing band.

When there's no more room and you get into a MESS LIKE THIS



CLEAN IT UP LIKE THIS!

WITH PORCELAIN PRODUCTS FOUR-IN-ONE SPOOLS

The secondary main alone in the spool groove. Separate dead ending hole for each service drop.

Engineered specifically for multiple service take-offs by a utility engineer with years of practical experience. Saves over a foot of conductor on each drop! Eliminates "feed backs" and reduces possible radio interference. Adequate insulation between each conductor. Saves Labor. Reduces possibility of shock hazards to linemen. Makes possible even distribution of sag. Make service changes or secondary changes without one interfering with the other.

Porcelain Products, Inc.
FINDLAY, OHIO

The BASCULE GATE

ROUNDING out the SMITH LINE of Water Control Equipment, the Bascule Gate is added to Smith Roller, Taintor, Sluice, and other type gates. It is particularly useful for pond level service and flood and ice control.

Designed and built in span and height for installations requiring greater spillway capacity or increase in pond storage above existing dam heights.

Obtainable in any size up to 10' in height by 100' in length. It also provides such outstanding advantages as controlled regulation, automatic or manual operation, hydraulic or motor drive and a long unobstructed spillway.

Described in full detail with necessary drawings in Bulletin No. 153 just published.

Send for your copy today!

S. MORGAN SMITH CO.

YORK, PENNA.

SUNBEAM LIGHTING FOR MODERN STORES EMPHASIZES SALES APPEAL

L1710 series with spotlights

L1500 series

visionaire LIGHTING CONCEPTS

SUNBEAM LIGHTING COMPANY • 777 EAST 14TH PLACE • LOS ANGELES 21, CALIFORNIA

L5600 series with spotlights

Store lighting, today, is more than the attainment of high levels of illumination for comfortable seeing. It requires advanced illuminating engineering to install a lighting system, balanced to bring out colors and textures, that will create "atmosphere," a "sense of space" and add dramatic accents to merchandise for assured sales appeal. This depends directly upon the versatility of the luminaire design and its flexibility for light distribution control. Certified by photometric tests, Sunbeam fluorescent and incandescent commercial fixtures meet the challenge and demands of good store lighting. Typical of many Sunbeam lighting installations, the aesthetic effectiveness and practical solution to the illumination of three modern stores is shown here. See your leading electrical distributor for Sunbeam's complete line of lighting fixtures.

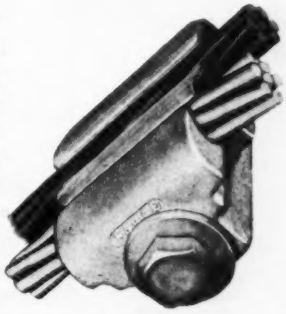
There's a *One-piece...Vise-type* *FARGO CONNECTOR* to meet your "specs" *plus* performance...ease of installation ...overall economy.

THE "5000 Series" FOR COPPER CONNECTIONS: Fargo's Standard Connector—obtainable in bronze or plated bronze. Its vise-type construction provides an ideal . . . vibration proof contact —high in conductivity . . . with high compression at low wrench torque. It is easy and safe to handle . . . requires no attention after installation—can be used over and over again. Available from #8 sol. to 1000 MCM.

THE "8000 Series" FOR ALL-PURPOSE CONNECTIONS: This series utilizes a bronze body and copper spacer for copper conductors. Also plated for all-purpose use and for friendly contact with aluminum. Liberal spacer provides adequate conductor spacing minimizing galvanic corrosion of dissimilar conductors. Fits wide range of conductor sizes—thus reducing the number of connector sizes to be stocked.

THE "7000 Series" HEAVY DUTY CONNECTOR: This series is designed with wide jaw contact areas and has better-than-conductor resistances. It is equipped with a heavy copper spacer that is massive in design for better heat dissipation during faults. Available in bronze for copper connections—or plated for all-purpose use in sizes from #6 to 1000 MCM. Also available in aluminum for Al. to Al. or Al. to Cu. in sizes from 350 MCM to 1000 MCM.

THE "9000 Series" FOR ALUMINUM-TO-ALUMINUM or ALUMINUM-TO-COPPER. This series features all-aluminum construction with wide jaws for better contact resistances . . . low relaxation or cold flow of conductors. Massive design provides for better heat dissipation under faults — like metal contacts increase service life. Available for aluminum and copper combinations in sizes ranging from 8 sol. to 397.5 MCM.



...*"built like a vise — grip like a vise."*

Ask your Line Material Field Engineer to give you complete details.

FARGO

Manufactured by
FARGO MFG. COMPANY, INC.
Poughkeepsie, N.Y.

Distributed by
LINE MATERIAL COMPANY
(A McGraw Electric Company Division)
Milwaukee, Wisconsin

LM®

Piasecki Helicopter Corporation, makers of two of Uncle Sam's most important helicopters—the 14-passenger Air Force Work Horse, and the 6-seat Navy HUP—has installed Marcus dry type Transformers to do the vital power job in their big new plant at Morton, Pa.

They were selected because every detail of the Marcus dry type transformer is engineered for long life . . . and continuous, trouble-free performance. Latest contribution pioneered by Marcus for greater transformer durability is Hi-Heat, Hi-Dielectric Magnet Wire, insulated with DuPont's newest miracle polyester film "*Mylar*," combined with Johns-Manville "*Quinterra*" to reach insulation levels at least 10 times present industry standards.

Capacities from 1 to 3000 KVA

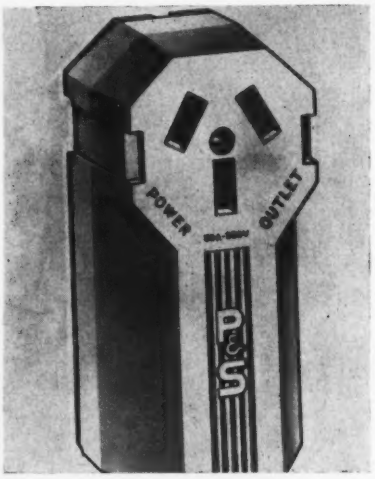
- DISTRIBUTION
- GENERAL PURPOSE
- UNIT SUBSTATION
- PHASE CHANGING
- ELECTRIC FURNACE
- RECTIFIER
- WELDING
- MOTOR STARTING
- SPECIAL

"Mark of Quality"

Representatives in Principal Cities

MARCUS TRANSFORMER CO., INC.
HILLSIDE 5, NEW JERSEY

ONE OF THE WORLD'S LARGEST MANUFACTURERS OF DRY TYPE TRANSFORMERS EXCLUSIVELY



Range Receptacle

(19) Pass & Seymour Inc., Syracuse 9, N. Y.

A new range receptacle, 3826-W, is in a white finish to match kitchen equipment. Features listed are: plenty of wiring room between cable clamp and terminal block so that pliers can be used to position cable; large radius on ends of heavy phosphor bronze contacts permitting cap to be inserted easily. Cable clamp closes opening completely regardless of size of wire used. Self-positioning aligning ribs and grooves in cover and block eliminate breakage of covers in installations. Mounting screw is retained in cover and will not fall out during installation, centers itself immediately, starts easily; lay-in type pressure terminals are easy to wire, the manufacturer states.

Copper Wire

(20) Essex Wire Corp., Fort Wayne, Ind.

Sil-X, tinned copper-strand, silicone-rubber-insulated, glass-braid, lacquered wire, will retain its flexibility at a low of 104 and a high of 400 F. It is claimed to be highly resistant to flex cracking, to have excellent insulation resistance at high temperatures and to retain its physical properties. It is fungus resistant and will not become brittle after long and continuous exposure to outdoor weathering at high and low temperatures, according to the manufacturer, who states that it has been approved by UL for use in lighting fixtures at temperatures up to 200 C and for use as radio and TV hookup wire up to 150 C. It will be approved by UL for devices or in appliances for temperatures up to 200 C but consumer must apply for approval.

Prominent Distributor tells why he prefers to sell fluorescent fixtures using CERTIFIED BALLASTS

ARTHUR N. ANIXTER, *of Englewood Electrical Supply Company*

"We prefer to sell fluorescent fixtures that use Certified Ballasts because they reduce ballast trouble and keep our customers satisfied," says Arthur N. Anixter of Englewood Electrical Supply Company, an outstanding Midwestern fixture distributor.

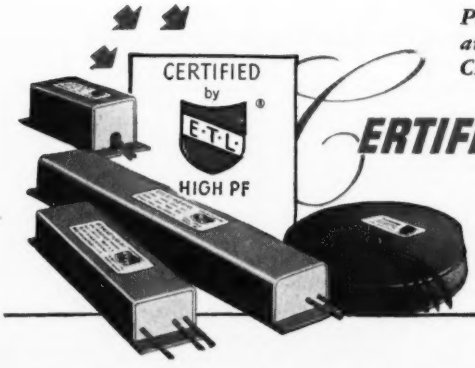
Architects, engineers, fixture manufacturers, contractors and distributors alike know that CERTIFIED BALLASTS assure—

Full Lamp Life **Rated Light Output** **Long Ballast Life**

CERTIFIED BALLASTS are made by 10 leading manufacturers to precise specifications, then tested by Electrical Testing Laboratories, Inc., which certifies they conform to these high standards.

Write for complete information on the types of CERTIFIED BALLASTS available from each participating manufacturer.

Participation in the CERTIFIED BALLAST program is open to any manufacturer who complies with the requirements of CERTIFIED BALLAST MANUFACTURERS.

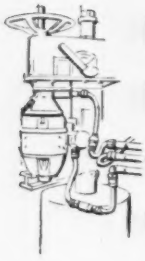


CERTIFIED BALLAST MANUFACTURERS

Makers of Certified Ballasts for Fluorescent Lighting

2116 KEITH BLDG., CLEVELAND 15, OHIO

PYLE-NATIONAL



PLUGS and RECEPTACLES for Motorized Valves

- *Shorten out-of-service time*
- *Assure proper reconnection*
- *Save time and labor*

Pyle-National's safe, easy to handle heavy duty plugs and receptacles quickly pay for themselves when used for connecting electrical equipment that must ever be relocated or disconnected for inspection or repair.

Labor expense involved in disconnecting individual wires, (or breaking soldered connections), and marking wires and terminals is eliminated. The length of time valuable equipment is kept out of service is cut to a minimum.

There is a Pyle-National connector for every application, including an *explosion-proof* series for hazardous locations.

Write for detailed literature.

QUELARC* heavy duty circuit breaking series. 2, 3, and 4-pole. Rating up to 200 amperes.

TRIPLOC* multiple-pole series. 1, 2, 3, 4, 6, 8, and 12-pole interchangeable and reversible contact units. 2, 3, and 4-gang units for up to 48 poles.

Sold nationally through electrical distributors

*T.M. Reg.

THE PYLE-NATIONAL COMPANY

1364 NORTH KOSTNER AVENUE, CHICAGO 51

PYLET CONDUIT FITTINGS • FLOODLIGHTS

BULLETINS ETC.

(21) M-G REFERENCE BOOK—To help in selecting motive power to handle most industrial applications, a motor and generator reference booklet is offered by Allis-Chalmers Mfg. Co., 939 S. 70th St., Milwaukee, Wis. The 50-page pamphlet, 51R7933, is reprinted from the 1952 edition of Lincoln's Industrial-Commercial Electrical Reference published by the Electrical Modernization Bureau. Allis-Chalmers furnished text and illustrations on integral horsepower motors and generators for the book.

(22) SIX-YEAR RECORD — A picture-story account of its company personnel and operations is offered in an attractive booklet published by Preformed Line Products Co., 5349 St. Clair Ave., Cleveland 3, Ohio.

(23) CONTROL RELAY—Application and design information about the type N control relay is offered in booklet B-5817 from Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa. Designed for remote control operation, it is used to sequence multimotor machines, to operate solenoids and to obtain pilot control from pushbutton stations of electrical circuits associated with such functions as temperature and pressure regulation.

(24) SWITCHES—Type TG-2 outdoor group-operated rotating-insulator vertical-break air switches, 115 and 161 kv, 600 and 1,200 amp, are described in catalog 128 issued by Pacific Electric Mfg. Corp., 5815 3rd St., San Francisco 24, Calif.

(25) CLAMPS—A data sheet on its Strateline clamps is offered by Ohio Brass Co., Mansfield, Ohio. These clamps are intended chiefly for urban and rural primary feeder deadends. The largest size, 0.86 to 1.55-in. seat diameter, is recommended by the manufacturer for supporting cable buses in substations where conductor sections are large but tensions not high. Comes in a choice of aluminum, bronze or malleable iron with liners.

(26) CABLE CAPACITY TABLES—Okonite Co., Passaic, N. J., has issued a booklet on direct-burial installations for users of 0- to 5,000-v nonmetallic sheathed power cables. Construction features, dimensional data and installation recommendations are included in addition to current-carrying capacity data. The bulletin is designated OK-1066.

(27) OIL SEAL—A new six-page booklet, with step-by-step directions, photographs and diagrams, tells the story of Harvel Oil Stop, claimed to provide an absolute oil seal on cable splices where oil pressure is encountered. The product is made by Irvington Varnish & Insulator Co., 6 Argyle Terrace, Irvington 11, N. J.

(28) INSULATION — In "Quinterra-Quinorgo" Johns-Manville, 22 E. 40th St., New York 16, tells about electrical insulations made of purified asbestos. Tables, test methods, application techniques, diagrams, step-by-step photos are included.

(29) PANELBOARD — Noark Flexunit plug-in distribution panelboards are described in a booklet from Federal Electric Products Co., 50 Paris St., Newark 5, N. J. Specifications and enclosure sizes and features are given.

(30) COOLING TOWERS—Foster Wheeler Corp., 165 Broadway, New York 6, describes its cooling towers in catalog CT-52-4.

(31) CATALOG — The 1953 edition of the Trumbullist, general catalog of Trumbull Electric Department, G-E, Plainville, Conn., gives complete listings of its line. Colored divider sheets separate the various product sections.

(32) WIRING DIAGRAMS—A 24-page wiring diagram bulletin for its model 709 magnetic across-the-line starter is available from Allen-Bradley Co., Milwaukee, Wis.

ELECTRICAL WEST
68 Post St., San Francisco 4, Calif.

Not good after July 1

Please send me, without obligation, the new product information or catalogs described on the following pages and identified by numbers circled below:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

Advertising on page.... ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

NAME..... TITLE.....

COMPANY*.....

ADDRESS.....

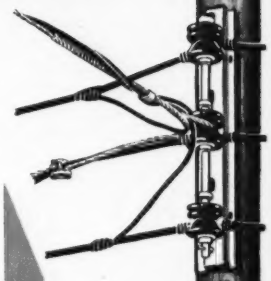
CITY..... STATE.....

*Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

ANACONDA Type N-SD

Service Drop Cable with copper or aluminum conductors

YOUR CHOICE OF INSULATIONS:
neoprene
polyethylene



overall cost is lowered

from pole

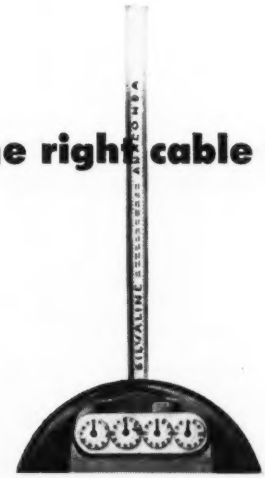
to weatherhead

TO HELP CUT THE COST of service connections, Anaconda now offers an outstanding service drop cable. This ANACONDA Cable is highly dependable . . . durable . . . and extremely weather-resistant.

TWO INSULATED CONDUCTORS are wrapped around a bare neutral messenger so that the full support of the assembly is borne by the messenger wire. The conductors remain free of tension.

ASK YOUR NEAREST Anaconda Sales Office for full information on this up-to-date ANACONDA Type N-SD Service Drop Cable. Or write for descriptive Bulletin DM-5121 to *Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.*

53306



the right cable for the job ANACONDA®

WIRE AND CABLE

FROM WEATHERHEAD TO METER, SILVALINE IS BEST
Weatherproof Silvaline* (URC Type SE) is Anaconda's completely new service entrance cable. It handles easily, offers long service life, and its silver finish coating may be painted without danger of discoloration. Silvaline is approved for installation from pole to house to meter.
*Trademark

ELECTRA'S HUSBAND

"NOW we've seen and heard everything," I said in disgust to Electra one night as I turned the switch on our nephews' television set. The objectionable commercial had set a new high (or low) in give-aways. Bring your old car to this particular dealer's establishment, the announcer said, and you could drive out in a new car with up to $300 cash and an order for a new Easter suit in your pocket. Furthermore you would have 60 days before the first payment on the car was due.

"You're the one who likes television," Electra chided. "I didn't insist that we watch that fifteen-year-old movie."

"I'm not griping about the program," I said. "It was the commercial. Watch television, listen to the radio and even read many of the advertisements and what do you see and hear? No good solid sales arguments about a product. All you hear about is a gimmick or give-away. No virtues of the merchandise. No reasons why you should buy that particular brand. No customer benefits. Send a label off of one of our cans and 25c and we'll mail you a dozen magnificent gladiolus bulbs. Three box tops and 50c and we'll send you a set of kitchen knives. The advertising people must have gone crazy."

"This morning's paper had an ad in it advertising Jack Benny's vaudeville show only it was signed by Lucky Strike," Electra commented. "It didn't say anything about cigarettes either. I didn't know Jack Benny needed advertising."

"His show does," I said. "When the premium gets more words on radio or TV or more space in the newspaper or magazine than the product, then something is haywire with selling."

"Your electrical folks aren't entirely free from that criticism," she said. "There is an electric fryer ad in this issue of *Sunset* that makes a big pitch for a free trip to Europe."

"Yes, but you at least have to go to a dealer's store and listen to a sales presentation before you can get an entry blank for that one," I said. "That's legitimate—a gimmick to get people to look and listen. These other things put the gimmick first and the product second. It's a substitute for salesmanship. And a poor one at that."

While Electra read I sat and thought about all of the fancy deals that were developing around the country in the appliance game. One washer manufacturer rigs his dealers to give away a $20 kiddie car and a year's supply of soap with every new washer sold. Another counters with a trade-in deal where the potential customer is offered a $100 allowance on an old washer, even though the old machine only cost $69.95 originally. It is anybody's guess as to what the next deal will be in that field. Some other form of concealed discount will be developed.

SELLING—WITH A CRUTCH THROWN IN

Instead of using punchy advertising copy to attract prospects, the appliance folks are turning to all kinds of tricks. Three bottles of fancy cologne to the housewife who will just come in and visit with an appliance dealer. A package of prize flower seeds and a dozen imported flower bulbs from Holland for just watching an appliance demonstration.

The major television marketing areas are the places for fantastic deals. The customer can get "free" lamps, tables and hassocks with a TV set. On a trade-in any old radio is worth $50 and upward. The fanciest proposition though is the so-called $600 set for $299.95 offered because of a "special purchase of a zillion carloads direct from the manufacturer." Fact of the matter is that on the basis of comparable values the set is worth only about $229.95. If the prospective purchaser could read the hieroglyphics on the sales ticket, he would know what the salesman knows: that the salesman's commission drops as the price goes down from $299.95 to $229.95 which is the absolute floor. It's funny in a case of that kind how the set can develop a slight scratch or mark which will permit a $50 reduction in price just about the time the prospective purchaser's interest begins to wane. Fortunately there aren't many dealers of that type—just enough to make the customer wary.

Where are the salesmen and what's happening to selling, I thought. Whatever is wrong, it is unfortunate. Selling and salesmanship helped to make our free man's economy what it is. With the productive capacity of that economy at the highest peak in all times, selling and salesmanship will be needed to sustain it. Will they be able to do it? I wonder.

A BUNCH of the appliance boys were gabbing of these and those as we sat around the Friday table for lunch. Business hadn't been too hot lately and the talk went to excuses for it. The usual gag was made to the utility boys about financing some kind of promotion to stir up interest in laundry equipment. There are a couple of good Irishmen among them who know how to take care of themselves in the clinches, so they countered with a good question.

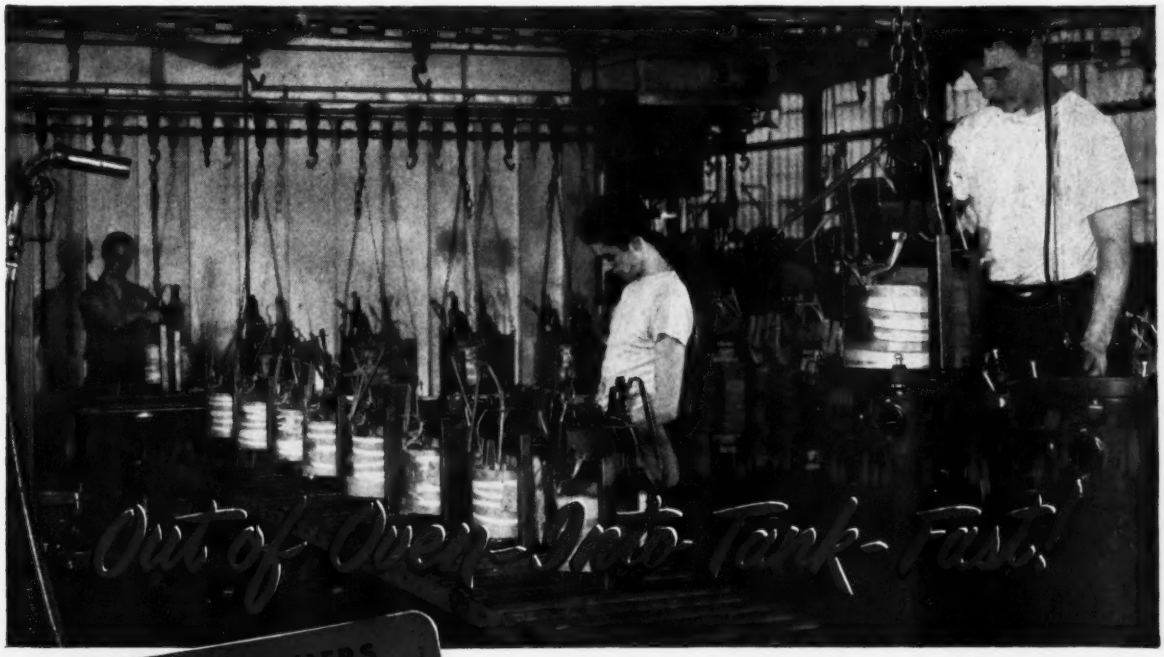
"Well, what kind of a promotion do you have in mind? Let's dream up a good one and maybe we can sell it to the boss." And they were off—

It would be a washer, dryer, ironer deal with electric water heater thrown in. There'd be a big show at one of the theaters, like a cooking school. But instead of cooking, there'd be bathing —er, that is washing. Of course there would be beautiful models to ba—wash, or watch is the word. The new synthetic fabrics would be featured. The models could be soaked in a simulated shower and the new fabrics shown to spring back into perfect shape. For contrast, one of the boys opined, an old-fashioned cotton dress could be worn by one and it would shrink. This gave another chap a better idea.

Why not have a beautiful model, in a gown of the new synthetics that won't stand hot water, step into a hot shower, thus advertising the water heater, and have her clothes dissolve to do a refined strip.

Another would contrast the greater safety to a buxom gal pitting the new automatic washer against the old wringer. Play up the safety angle, or curve, he said. Some promotion!

How Moisture is Kept Out of Transformer Coils



Fast sequence from drying oven into tank is one reason why you get consistently excellent insulation quality in Allis-Chalmers distribution transformers.

Here's How It's Done

Core and coil assemblies move continuously through the tunnel-type electrically heated oven partly shown in the background above. Then . . . immediately after the drying cycle is complete . . . they are immersed in dry oil in their own tanks. This prevents any absorption of moisture that might have occurred if the cooling had been done in air. Then a vacuum drawn on the transformer removes any air entrapped in the oil.

Finally, Production Line Impulse Testing

As a final step, production line impulse testing is used to assure uniform high insulation strength.

Get All Benefits

Careful attention to manufacturing detail is only one of the many reasons why you benefit when Allis-Chalmers distribution transformers are on your system. For complete information, call your nearby A-C district office or write Allis-Chalmers, Milwaukee 1, Wis.

A-3977

ALLIS-CHALMERS A-C ALLIS-CHALMERS

Responsibility...

and the war with

Thirty years ago, when mysterious breakage in overhead conductors was being blamed on "crystallization," Alcoa engineers helped prove that the real villain was fatigue from vibration, caused by air currents.

Ability to define the true nature of vibration problems and solve them came naturally to Alcoa, then as now the first name in aluminum conductors. In the first laboratory built for the purpose, an intensive research program was launched.

Out of thousands of tests came the refinement of Alcoa Armor Rods and Stockbridge Dampers—recognized for the past quarter century as standard protective devices for overhead line conductors.

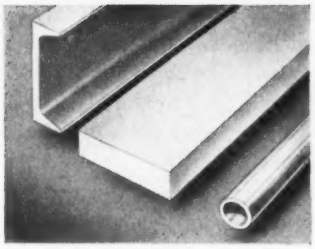
The sense of responsibility which prompted this program still prevails today. It extends through every phase of design and manufacture to provide you with assurance of outstanding service from Alcoa Aluminum Electrical Conductors.

Call your Alcoa sales office for aluminum conductors *and* for accessories that are right—on the line. Aluminum Company of America, 2103-E Alcoa Building, Pittsburgh 19, Pennsylvania.

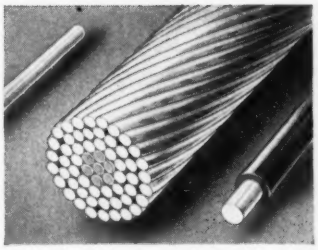
Alcoa Aluminum

ALUMINUM COMPANY OF AMERICA

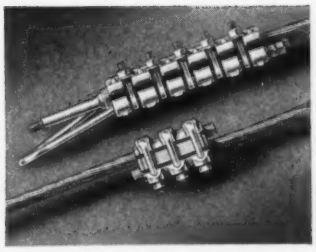
"SEE IT NOW" with Edward R. Murrow—CBS-TV every Sunday—brings the world to your armchair. Consult your newspaper for local time and channel.



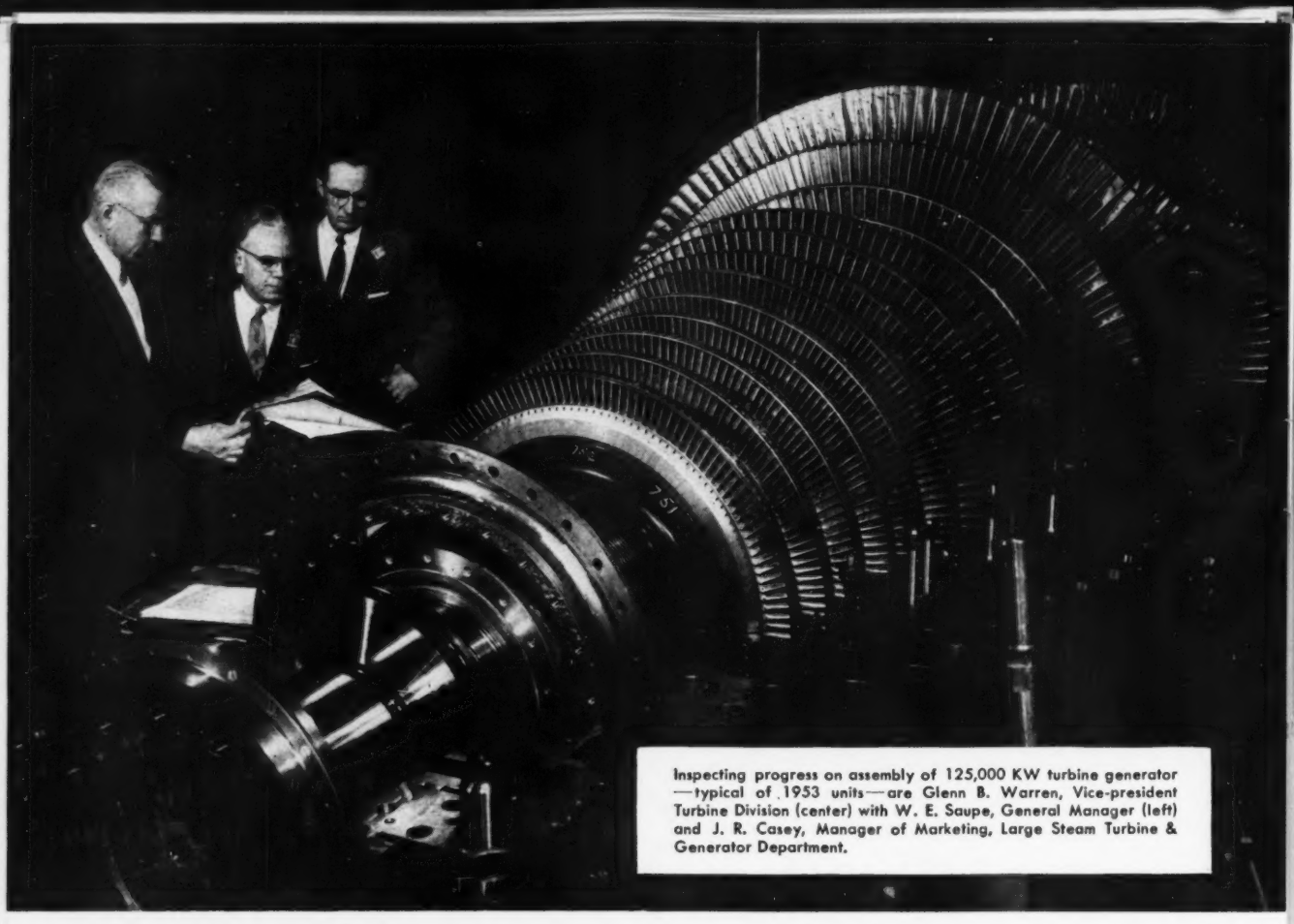
Alcoa Aluminum Bus Conductors are available in rectangular and round bars, tubes and structural shapes.



Alcoa Aluminum Electrical Conductors include ACSR, solid and stranded aluminum wire, bare or covered.

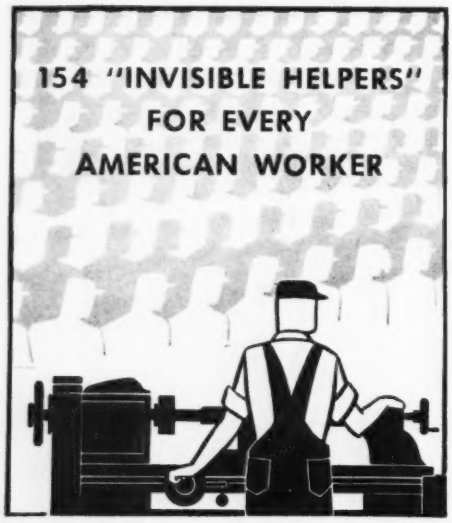


Alcoa offers aluminum accessories, correctly designed for use with aluminum conductors.



Inspecting progress on assembly of 125,000 KW turbine generator —typical of 1953 units—are Glenn B. Warren, Vice-president Turbine Division (center) with W. E. Saupe, General Manager (left) and J. R. Casey, Manager of Marketing, Large Steam Turbine & Generator Department.

G-E turbine output for 1953 to equal muscle power of 136 million "invisible workers"



"Invisible battalions" of electric workers are one of the secrets of American productivity. Due to increasing use of electric power, every American worker has now the equivalent of 154 "electrical helpers" compared with about 94 in 1940. And the battalions are still growing!

Record 6,200,000 KW scheduled as utility expansion continues in high gear

Anticipated G-E turbine production of 6,200,000 KW for 1953 will exceed the record established last year by nearly 10 percent.

Continually increasing demands for electric power are reflected in the fact that the average unit size of turbine generators on order is 91,400 KW—nearly double the average of five years ago. More than 50 percent of the steam turbines to be shipped in 1953 will be of the reheat type—strong evidence of a growing trend to higher efficiency spurred by rising fuel costs.

One of the dramatic illustrations of the productive power of electric energy is the fact that one kilowatt, continually applied twenty-four hours a day, is equivalent to the muscle work of twenty-two strong men. On this basis, the projected G-E turbine output for 1953 will add 136,000,000 "invisible electric workers" to swell the nation's productive power.

General Electric Co., Schenectady 5, N. Y. 301-229

1878 75 1953 YEARS OF ELECTRICAL PROGRESS

MORE POWER TO AMERICA

GENERAL ELECTRIC

MAY 1953 Vol. 110, No. 5

ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.

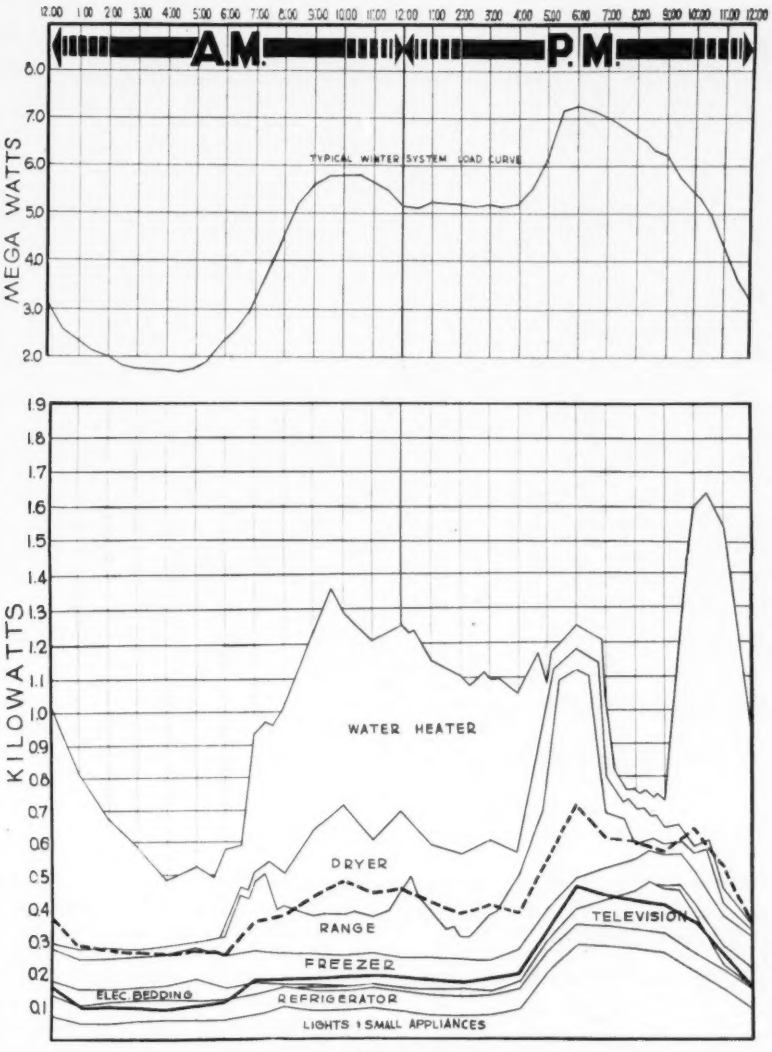


FIG. 1

Why Utilities Promote The Load They Do

Answering a question dealers often ask

Robert H. Cockfield *

Business Agent
Los Angeles Department of Water and Power

I HAVE had a feeling for quite some time that the approach to our residential load-building problem has been entirely too much along the lines of costs, rates and net return from an individual appliance, rather than to appraise the residential load development program in its entirety.

If we place ourselves way up the management ladder, where the affairs of the utility are administered, we realize that we really have two major responsibilities: (1) to provide a fully adequate and reliable service to the customer; (2) to make that service available at the lowest possible cost.

The matter of adequate service we leave to the engineers, but in the matter of lowest possible cost, we in the sales promotion end of the utility have something to offer too. There are a number of ways to control costs: good engineering, efficient management, a sound financial program and, in the case of an electric utility, continuous and efficient use of its generating and distribution facilities throughout each day of the year. It is in the matter of efficient use of our facilities that we of the new business departments can contribute most to the job our managements and boards have to do.

We all know that you do not just go out and sell kilowatt-hours as such nor does the customer call and place an order for, say, 10,000 w delivered the day after tomorrow. Our product is only bought as a means to an end and not as an end in itself.

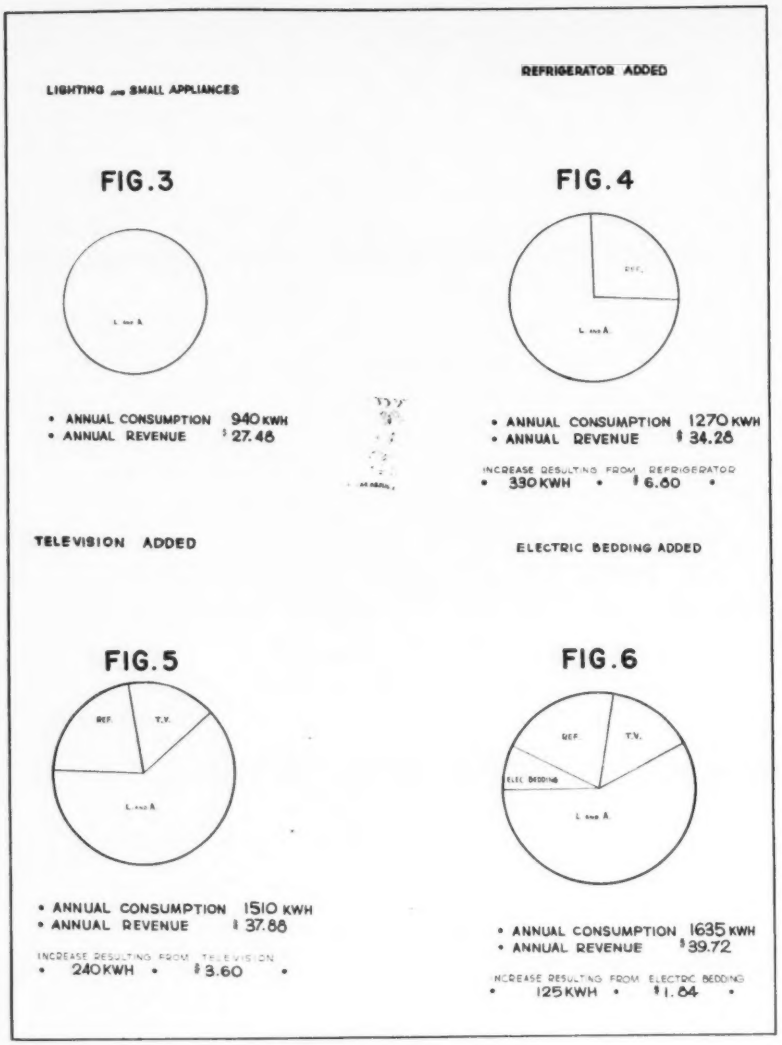
The appliance is the object that is actually purchased and the electric energy is only the incidental means of operating the appliances the customer owns, or will buy, thereby providing him with the comforts and conveniences desired. So it becomes obvious that if we want to increase the use of our system at any particular time of day or season of the year, we must think in terms of the equipment and appliances that the customer uses at these times or in these seasons; or, in other words, of the operating characteristics of each of these devices as related to our own system load characteristics.

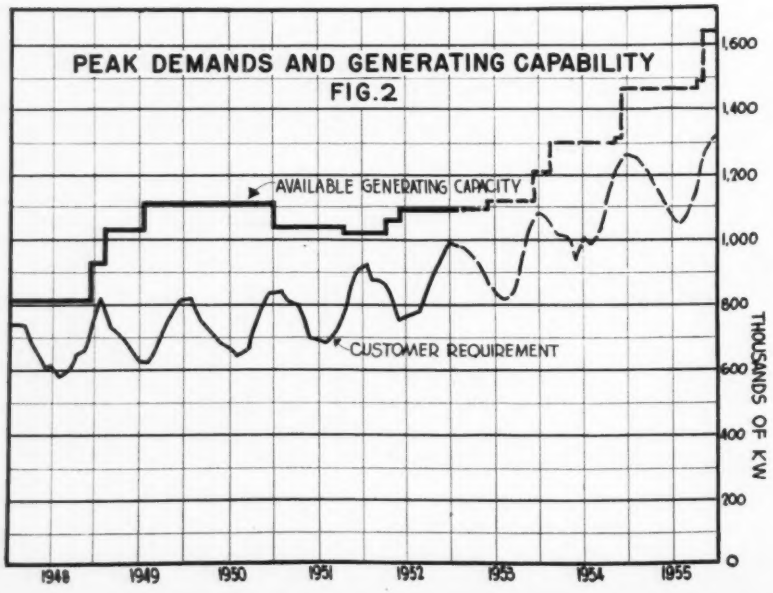
The top solid line in Fig. 2 represents the present and projected gen-

* Based on a talk originally given last August to the NAED, Pacific Zone, at Riverside.

erating capacity of the Department of Water & Power electric plants, with, of course, Hoover Dam power included. The saw-tooth line across the chart represents the maximum demand that our customers place on our system during the various months of the year. The point of the saw-tooth is the winter maximum demand, and the valley is the demand during the summertime. Each of the saw-tooth points represents the amount of power plant capacity we must have in operation at the time of this maximum demand. Further, the amount of this maximum use of service determines the extent of our capital investment, and the higher the demand for energy, irrespective of the number of hours of use, the more investment we have to make in power generation, transmission and distribution facilities. Therefore, it follows that any energy that appliances consume during the summer, late spring or early fall is off-peak energy so far as system investment is concerned; and this off-peak energy has relatively little fixed charges, for we already have provided the plant capacity necessary to supply the higher winter peak demands. There is one service that fits nicely into this valley period: that is the refrigeration and comfort cooling loads, freezer, evaporative cooler and air conditioner. In these we are very much interested.

Not only do we have maximum demand periods during the year, but we also have peak demands during the 24 hours of the day. In order that we might consider our worst condition, demandwise, let us look at the curve at the top of Fig. 1. This is the daily



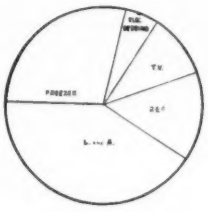


load curve for a day in December, which occurs during the annual peak period described in Fig. 2. During the early morning hours when people are sleeping and commerce and industry are at their lowest ebb, the demand on our system is very low. However, as daylight comes, the normal activities of making a living build up the daytime demand. When the day and night loads overlap, we have our highest daily and annual peak. This occurs between 5:30 and 6 p.m. You can put the dollar sign on this peak because we must have the generation, transmission and distribution capacity to satisfy that demand, regardless of whatever else is required during the rest of the day. It is our customers' use of energy during that peak period that determines the capital investment that we must make for plant facilities.

With this peak period in mind, let us take the various domestic electric

FREEZER ADDED

FIG.7

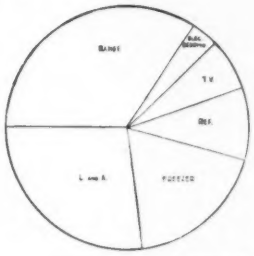


• ANNUAL CONSUMPTION 2265 KWH
• ANNUAL REVENUE $49.51

INCREASE RESULTING FROM HOME FREEZER
• 650KWH • $9.79 •

RANGE ADDED

FIG.8

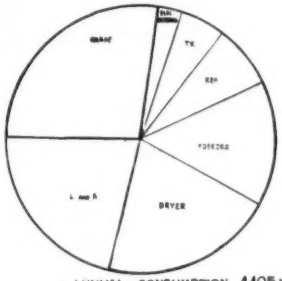


• ANNUAL CONSUMPTION 3485 KWH
• ANNUAL REVENUE $64.80

INCREASE RESULTING FROM RANGE
• 1200KWH • $15.29 •

DRYER ADDED

FIG.9



• ANNUAL CONSUMPTION 4405 KWH
• ANNUAL REVENUE $76.30

INCREASE RESULTING FROM DRYER
• 920 KWH • $11.50 •

WATER HEATER ADDED

FIG.10

• ANNUAL CONSUMPTION 8205 KWH
• ANNUAL REVENUE $102.90

INCREASE RESULTING FROM WATER HEATER
• 3500 KWH • $26.60 •

appliances, see what their load characteristics are, and how they relate to the system load characteristic. The other curves on Fig. 1 are intended to show the average contribution each appliance makes to the daily load characteristic as they are added one after the other.

The bottom area in Fig. 1 represents the use that one of our average customers, having lights and small appliances only, makes of our service. We do not actively promote this load, and the reason is evident. This load has its greatest use right at the time of our system maximum demand. It is a low load factor load and incremental increased would be purchased at the lower steps of our rate schedule.

The domestic refrigerator load is quite a different story in that it is a uniform load throughout the day and year. The area in Fig. 1 shows that the refrigerator load is constant with no pronounced peak characteristics and consequently a very valuable load. The home freezer has essentially the same load characteristics, with the possible exception that because of its placement in the garage or service porch, it would be more susceptible to outside temperature variations. This would cause a greater consumption by the home freezer during the off-peak summer months and to that extent it is even a better load than the refrigerator.

We have seen a lot of television come on our lines during the past few years and the question is sometimes asked, why don't we promote television. The TV area in Fig. 1 shows the effect television has on the average daily customer and load characteristics. The principal use is from 7 to 9 or 10 p.m., with relatively little use during the remainder of the day. The chief reason for not promoting television, however, is that in a little more than four years television saturation has grown from practically nothing to almost 80% ; and any time the industry can of itself develop those kinds of saturations in such a short period of time, no utility support is necessary and its promotional efforts are better spent in helping expand the markets for the less accepted items. The utility's money should rather go into promoting the appliances that are of greater benefit to the utility and into assisting the industry in selling those appliances that need promotion, thus helping to expand the market for them. The television market is already here.

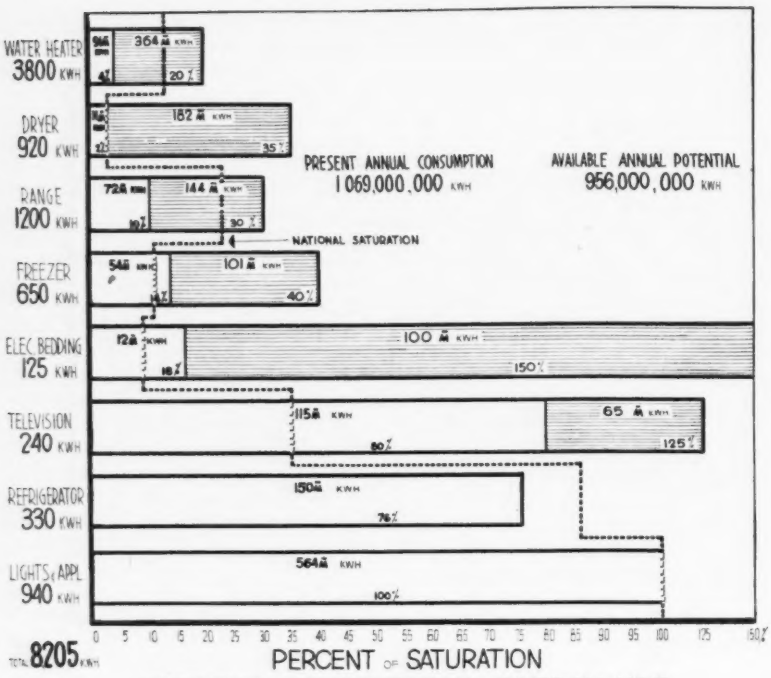
The shaded areas show the characteristics of the electric bedding load. The fact that this occurs exclusively in the late evening and early morning hours makes electric bedding a very desirable off-peak load for the utility even though it is largely a winter load.

The electric clothes dryer shows some peak use but proportionately the greatest use is during the daytime where it fills in our daytime load very nicely.

The area representing the electric range shows some use during the breakfast and lunch periods, but by far the greatest demand occurs right on the system peak. This doesn't mean that we are not encouraging electric range use as one of the major steps to electrical living, but it does show why it is absolutely necessary for us to promote the other appliances to spread out our use curve and get better residential load characteristics.

The water heater, when added to the home, greatly increases the level of daytime use; yet because of the time control, it causes very little increase on our daily peak. The water heater load, because of its desirable characteristics, does and will continue to receive our active promotion. From the standpoint of hours of use as related to its contribution to system peak, it is the best load we can develop.

In succeeding figures, the annual energy use and revenue return for these same appliances are shown in the same sequence. Fig. 3 shows the average annual consumption and bill for our lighting and small appliance customers. Fig. 4 shows the same hypothetical customer with refrigerator added; Fig. 5 with television added; and Fig. 6 with one electric bedding unit added. This chart in Fig. 6 most closely resembles our present average residential customer, who presently purchases about 1,800 kwh per year. By adding the other uses in Figs. 7, 8, 9, and 10 we arrive at the average all-electric customer's consumption and bill exclusive of space heating.



PRESENT AND POTENTIAL ENERGY USE
FIG. 11

The 8,205 kwh annual consumption in Fig. 10 is nearly five times the consumption of our present "average" customer. The $102.90 annual revenue return is about 2½ times as much as we receive from the "average" customer. If this gives some idea as to what our opportunities and potentials are for one customer, let's consider what they might be for all of our residential customers.

Saturations Possible

On Fig. 11 is shown each appliance and its annual consumption on the vertical axis with all of them adding up to the 8,205 kwh annual consumption in the all-electric home. Projected parallel to the horizontal axis is shown each appliance in its present estimated saturation on our system of approximately 600,000 residential customers. Thus, 100% of our customers are using lights and small appliances; 76%, refrigeration; 80%, television; 16%, electric bedding; 14%, home freezers; 10%, ranges; 2%, dryers; and 4%, electric water heaters. If you wanted to be very optimistic, you might imagine that each of the appliance bars ultimately would be filled in solidly to the 100% saturation line. However, I'm sure you recognize that this is not very probable, for the potential market for some of these items is obviously less than 100%. The consumption, indicated by the shaded area, of the number of all of these appliances now connected to our lines is estimated at one billion kilowatt-hours which, exclusive of space heating and other uses not included, is about the amount we are selling to our residential customers at the present time. For comparison, the heavy broken black line indicates the present national use of these appliances. It can be seen that we are ahead of the national saturation on television, freezers and electric bedding, but we lag behind with refrigerators, ranges and water heaters.

The horizontally lined section for each appliance represents an estimate of what we might reasonably expect our saturation to be 5, 10, 15, or 20 years from now, depending upon the amount of promotional effort.

With a reasonably strong appliance promotion program, we could expect an ultimate saturation of these appliances as represented by the horizontally lined sections. Of course, on lighting, the amount of use will increase, but we cannot expect more than the existing 100% of our customers to use it. Refrigeration, too, has now about reached its ultimate saturation point. We can easily visualize over 100% saturation on television sets and well over 100% saturation on electric bedding. We estimate potential home freezer saturation at about 40% and electric ranges at about 30%. With the current trend of the automatic clothes washer and dryer in a single combination unit, we might be able to realize more than 35% estimated dryer saturation. We are depending mostly on new construction for our water heater sales and if the present pace of building continues, our estimated 20% saturation of electric water heaters ultimately may be realized. If we were able to attain the acceptance of these appliances indicated by the horizontally lined sections, we could just about double our present sales without adding a single new customer, and we would also just about double our present average consumption per customer.

To refer back to Fig. 1, indicated by the heavy black line across the bottom of the chart, we see the use that our present average residential customer now makes of our system. The potential average customer use, assuming the future estimated saturations, is represented by the broken line. For those technically minded, we might point out that while we presently have a system load factor of approximately 59%, our average residential customer has a load factor of only 47%. In other words, our present average residential customer is actually depreciating the continuity of the use of our system. Our potential customer would have a load factor of 62% and would then contribute to system load factor.

Select the Load

In these days of rising costs and increased competition for the customer's buying dollar, we in the utility business face the same challenges that are now confronting all industry. We, too, must continue to provide "better goods and services" at the lowest possible costs. For the electric utilities *Selective Load Building* can be one of management's most important tools in meeting today's responsibilities.

Customers are buying, and will be sold, millions of dollars worth of home appliances and equipment without any consideration of the needs of the serving utility. Unfortunately many of the things those customers want and will buy are peak-building items; but through study, analysis and development and execution of strong hard-hitting selective load-building programs we can develop loads with compensating characteristics. If we do not, we may find that a high-peak, low-load-factor situation has been forced upon us, and we will have lost one of the most effective tools utility managements have in meeting their responsibility to provide the best possible service at the lowest possible cost.

Sno-Cats are an excellent mode of transportation for crews of the Soil Conservation Service in making annual spring snow surveys

Stream Flow Forecast Below Normal

R. A. Work
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Public and private power utilities, irrigation farmers and all other water users in the Western states are now receiving the most accurate and comprehensive information to be had on prospective water supplies through a recently coordinated forecasting program by the several agencies involved.

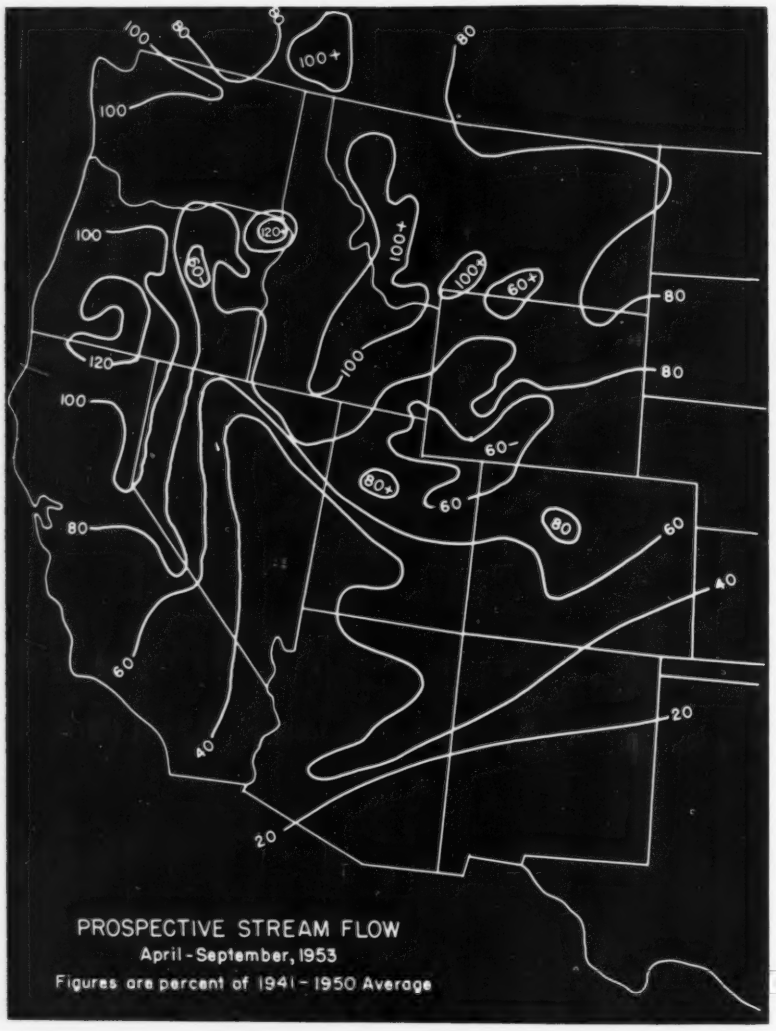
Under this new cooperative arrangement, which became effective Jan. 1, 1953, the U. S. Weather Bureau, U. S. Soil Conservation Service and California Department of Public Works continue to issue their respective water supply forecast and snow-survey water forecast publications after prior collaboration among the respective agencies. The Weather Bureau's "Water Supply Forecasts for the Western United States," published monthly from January through May, now contains all of the forecasts made by all three agencies.

Coordinated early season evaluations of potential flood hazard on snowmelt rivers, which are presented in the respective publications in years of heavy snow cover, draw upon both snow-survey and precipitation data. Weather Bureau river district offices will continue to prepare and issue short-range forecasts of river stages. The Soil Conservation Service will continue to make available to Soil Conservation District farmers, irrigation districts and others, operational advice based on these outlooks and forecasts.

The water supply outlook for Western states for the irrigation season now underway, as viewed by these agencies, is much less promising than last season. Threatening water shortages are foreseen for numerous areas, particularly in New Mexico, southern Utah, southern and central Nevada and parts of Arizona and Colorado. The following state-by-state inventory gives a more detailed accounting of irrigation season runoff prospects as reported to the Soil Conservation Service by the snow surveys.

ARIZONA—Only two major winter storms three months apart covered Arizona last winter. These two big storms brought about normal rainfall for the period October-March to southern Arizona but only 72% of the seasonal normal to northern Arizona. Snow cover has been below normal most of the winter. Above normal winter temperatures and heavy evaporation losses further reduced the northern Arizona snow pack. Because of snow pack losses and total deficiency of snow cover, it is forecast that flow of the Salt River will equal only 50% normal for April-May. Flow of the Verde River for the same period is not expected to exceed 35% of the

*The Soil Conservation Service is the federal coordinating agency of snow surveys conducted by its staff and many cooperators, including the Bureau of Reclamation, Forest Service, National Park Service, Geological Survey, various departments of the several Western states, irrigation districts, power companies and others. The California State Division of Water Resources conducts and coordinates snow surveys in that state, while the British Columbia Department of Lands and Forests, Water Rights Branch, has charge of the snow surveys in that province. The U. S. Weather Bureau makes west-wide water supply forecasts at more than 320 gaging stations, such forecasts being estimated principally on the basis of measurement of precipitation. The Weather Bureau forecasts are for the water year (October-September inclusive) whereas snow survey forecasts are for the irrigation season only.



Snow core taken with hollow tube is weighed on special scales to measure water content

10-year normal, 1941-50, and flow of the Gila seems likely to equal only 15% normal for the same period. Inflow into the Salt-Verde system peaked about March 21 and irrigation requirements then began to exceed streamflow.

Fortunately, fairly substantial water reserves have been accumulated on the Salt-Verde system — not quite as good as last year but at least better than the past 10-year average. Roosevelt reservoir now stores 1,049,000 acre-ft compared with 682,000 acre-ft last year and 652,000 acre-ft average for the 10-year period, 1941-50. However, important San Carlos reservoir on the Gila River now stores water only to one per cent of capacity, with dismal prospects for further inflow. Last year San Carlos stored 160,000 acre-ft on April 1, 12% of capacity. Storage on April 1, 1952, was only 14,500 acre-ft.

In recent years increasingly efficient water management is being practiced by farmers and irrigation companies in Arizona. It seems evident that the sharpest sort of water management will be called for in Arizona in 1953.

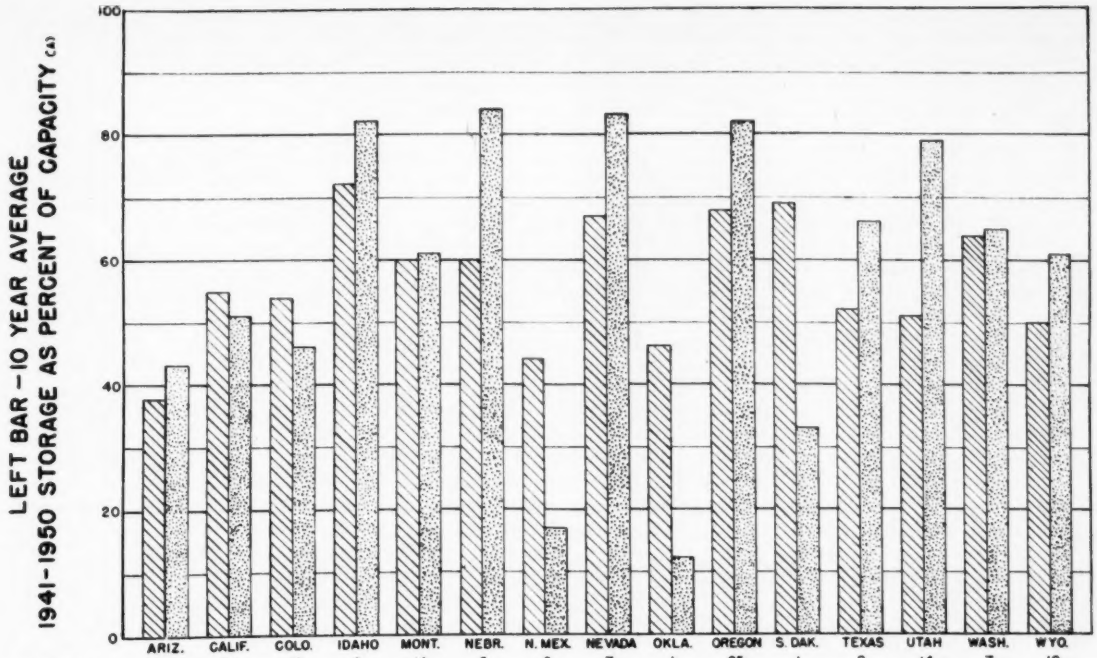
Flow of the Colorado River into Lake Mead for April-September will be about 60% of normal or near the minimum flow experienced since the reservoir was completed.

BRITISH COLUMBIA — Precipitation last fall was far below normal throughout the province. Consequently, the soil mantle in almost all areas will require considerable priming from the snow pack. This factor has been taken into consideration in the runoff predictions for 1953.

Runoff in the Main Columbia and West Kootenay River basins is expected to very nearly equal the average for 1941-50. The runoff in the East Kootenay basin is not likely to exceed 90% normal, but in the Okanagan and Similkameen drainage the runoff April-August will be even more below normal. For instance, the runoff into Okanagan Lake is forecast at only 55% of the average for 10-year period, 1941-50. Irrigators and other water users are warned that water supplies in this area may be deficient and they are advised to store as much of the spring runoff as possible.

The snow pack in the Skagit Basin in B. C. is also well below the average of the past six years and runoff is not expected to exceed 75% of the past six-year average.

CALIFORNIA — Water conditions in California are generally unsatisfactory except in the Klamath and Upper Sacramento basin. Deficient precipitation during February and March resulted in far less than normal increments to the snow pack, the water impounded in reservoirs and the water


LEFT BAR – 10 YEAR AVERAGE
1941-1950 STORAGE AS PERCENT OF CAPACITY (a)
RIGHT BAR
1953 STORAGE AS PERCENT OF CAPACITY
100
80
60
40
20
0
ARIZ. CALIF. COLO. IDAHO MONT. NEBR. N. MEX. NEVADA OKLA. OREGON S. DAK. TEXAS UTAH WASH. WYO.
RES. REPORTED 8 22 47 9 14 3 6 7 1 25 1 2 14 7 10
CAPACITY OF REPORTED RES. (1000 AC. FT.) 3527 2968 (B) 1879 (C) 3364 1018 (D) 2242 3658 1371 (E) 149 (F) 2925 198 2844 3347 1082 (G) 3841 (H)

RESERVOIR STORAGE AS OF APRIL 1, 1953

Condensed Information on Storage

Explanation: (a) Most state averages for reported reservoirs are for full 10-year period, but in a few cases reservoirs having shorter records are included; (b) Does not include Millerton or Shasta reservoirs (combined capacity 5,020,500 acre-ft), April 1 combined storage 4,061,100 acre-ft; (c) Does not include John Martin reservoir (capacity 655,000 acre-ft), April 1 storage 20,000 acre-ft; (d) Does not include Fort Peck reservoir (capacity 19,000,000 acre-ft), April 1 storage 12,750,000 acre-ft, does not include Flathead Lake (capacity 1,791,000 acre-ft), April 1 storage 641,000 acre-ft, does not include Hungry Horse reservoir (capacity 3,500,000 acre-ft), April storage 719,700 acre-ft; (e) Does not include Lake Mead (capacity 27,217,000 acre-ft), April 1 storage 17,764,000; (f) New reservoir in 1945; (g) Does not include Roosevelt Lake (capacity 5,220,000 acre-ft), April 1 storage 2,183,000 acre-ft; (h) Does not include Boysen reservoir (capacity 820,000 acre-ft), April 1 storage 557,000 acre-ft.

levels of the groundwater basins. The outlook for California based on the availability of surface water to meet irrigation demands during 1953, although generally unsatisfactory, does not appear to be critical except in portions of southern California and the southern San Joaquin Valley. Power output in the state will not be adversely affected by the deficiencies in surface water supply because of the high degree of integration among major hydro and steam electric plants.

The snow pack throughout the Cascade Mountains and the Sierra Nevada is considerably less than that of one year ago. Water content varies from 120% of normal in the Upper Sacramento River watershed to about 60% of normal in the southern Sierra Nevada. Normal precipitation conditions for the remainder of the season will produce normal or above normal snow melt runoff in the north coastal area and the Sacramento River watershed above Shasta Dam. Snow melt runoff for San Joaquin Valley streams will vary from 45 to 75% of normal. Under the assumption of no additional precipitation during the remainder of the season, the indicated snow melt runoff during the April-July period would be near normal in the north coastal area and from 25 to 70% of normal in the Central Valley area.

COLORADO — The flow of all streams originating in mountain areas in Colorado will be below normal for the 1953 season. Critical shortages of water are expected on the Arkansas, Rio Grande and the southern tributaries of the South Platte. Actual flow will range from about 80% of normal on the Upper Colorado River to 40% of normal on the Rio Grande and San Juan.

In irrigated areas on the South Platte and tributaries a shortage of water is expected except on the Cache la Poudre, Big Thompson and lower South Platte. On these streams supplemental water will be available from the Colorado-Big Thompson project. Even normal water supply is usually inadequate for the highly developed South Platte irrigated area. Storage in smaller irrigation reservoirs is about the same as a year ago but below the average of past years. On the Arkansas River the outlook is very poor. Streamflow there will be below normal; there is practically no reservoir storage and precipitation has been deficient at valley elevations for several months. The soil is dry.

The water supply outlook for the Rio Grande and tributaries in Colorado is poor but better than for the very dry years of 1950 and 1951. Reservoir storage carried over from the high flows last year is above normal. Valley soil moisture is fair and ground water for subirrigation is at high levels. Streamflow will range from 40 to 60% of normal.

West of the Continental Divide there will be some shortage of water on smaller streams and on the Dolores and San Juan tributaries. Colorado-Big Thompson reservoirs may be used to partially regulate flow on the Upper Colorado. Soil moisture conditions in irrigated areas in western Colorado are fair to good.

IDAHO—The snow pack over most of Idaho is normal or nearly so. The

snow line, in general, is high and low-altitude snow courses are generally slightly proportionately lower in snow cover than the courses higher in the mountains. Recent rain over the lower part of the river basins has partially erased the dry soil conditions found last fall before the snow began to accumulate. April - September streamflow is expected generally to be 95% normal. Reservoir storage for the state is 14% above average for this time of the year. Reservoir operators started to store water early in the winter, foreseeing this as the first year for more than five years that the water supply would be unlikely to exceed normal.

MONTANA — Snow cover on the Upper Columbia basin is good. At present, the Flathead basin has about an average snow cover, while the Clarks Fork basin is slightly above average. A good water supply for irrigation and other uses should result throughout the basin.

Snow cover east of the Continental Divide on the Upper Missouri River basin averages about 85% normal. The soil is not frozen under the snow, and the soil is generally dry to damp. Only in a few places was wet soil encountered on the watersheds.

Snow density is generally high for April 1. The snow is loose and granular. These two factors indicate that an early runoff is possible with the dry soil absorbing considerable water for soil priming.

Farming operations in areas below reservoirs should have a good water supply for most of the season, while those areas using water from unregulated streams are likely to find themselves short of water for irrigation purposes during late July and August.

NEVADA — Snow stored water ranges from good in the central Sierra to fair in northeastern Nevada and poor in the central and southern part of the state. U. S. Geological Survey reports October through March streamflow along the Humboldt and eastern Sierra above normal. Groundwater levels are also reported as slightly below normal.

Reservoir storage on April 1 averaged 83% of capacity and 120% of the past 10-year average. The 1953 snow water runoff will be normal or below for all streams in the state. The southern half of Nevada can expect very little if any snow water runoff. Along the Humboldt tributaries, streams can expect 50 to 75% of normal while the main stem will flow only about 30% normal. Runoff into Nevada from the east central Sierra will range from 70% normal in the south to normal in the north.

NEW MEXICO—The water supply outlook for the Rio Grande and its tributaries in New Mexico is for gravely deficient flow in 1953. The over-all state-wide water supply is likely to be the least in the past 25 years. Soils in irrigated areas along the Rio Grande are very dry. El Vado reservoir is empty in compliance with the Rio Grande Compact and probably will not be able to store water this year. The irrigation supply for the Middle Rio Grande irrigated area will be extremely limited.

Elephant Butte and Caballo reservoirs now contain 420,000 acre-ft. This is four times that stored a year ago at this date. However, the total of storage plus expected inflow into the reservoirs will not exceed 60 to 70% of the normal irrigation water demand.

OREGON — Oregon's 1953 water supply outlook, dependent on mountain snow cover, is "fair" to "good" with serious deficiencies to be expected only in the smaller streams heading in low-elevation watersheds. Water content of mountain snow cover averages 109% of normal state-wide on 124 measured snow courses, although only 70% of last year at this date. Reservoired water in 25 reporting reservoirs is 120% of average and will "save the day" for water users in many areas otherwise facing irrigation deficiencies. Effects of last year's long summer and fall drought have been largely eased by heavy winter precipitation and resultant mountain snow cover. Cropland soils have an excellent moisture content.

UTAH — With the exception of a peculiarly narrow belt of normal runoff prospects running across the state from the Salina Creek-Fish Lake area to the La Sal Mountain area near Moab, another small area in the Farmington-Bountiful vicinity and a strip draining into Wyoming from the high Uintahs, all other parts of the state can expect below average runoff during this irrigation season.

In southwest Utah runoff of the main and east forks of Sevier River above Piute reservior, the Escalante, Virgin and Beaver Rivers and Coal Creek near Cedar City, will be of severe drought proportions comparable to that of 1951, with runoff expectancy varying from 20 to 45% of the 1941-50 average. Runoff prospects for the Beaver River are the poorest since 1934.

Prospective runoff for Strawberry and Whiterocks Rivers and Ashley Creek in the Uintah basin ranges from 50-60% average.

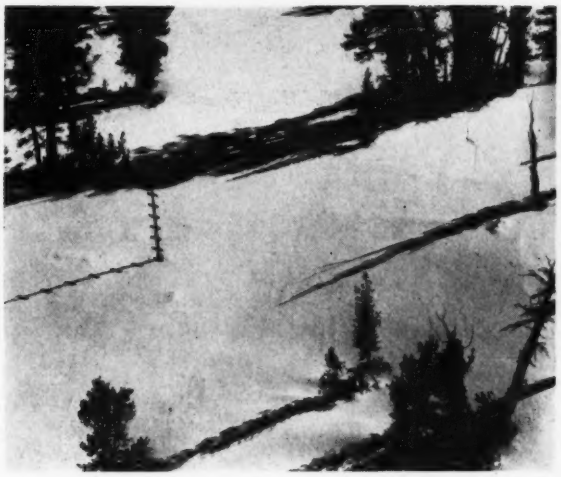
Runoff for all other streams of the state will range from 60 to 80% of the 10-year average. Very fortunately, holdover storage in 14 principal reservoirs now rests at 79% of capacity equaling 156% of the 10-year average. This means that water users in central and northern Utah, having storage rights, will have sufficient water during the irrigation season, whereas water users depending solely upon natural flow rights can expect definite shortage of water.

WASHINGTON—Snow surveys on the headwaters of the Columbia River in Canada and other major contributing rivers in the United States indicate a lower than normal water supply for this season. The flow of the main stem of the Columbia is forecast for the lowest flow in eight years if a normal spring melt season ensues. Water stored in smaller reservoirs (FDR excluded) is normal for this time of the year. New reservoirs, notably Hungry Horse, on the upper reaches of the main rivers will fortunately increase the water supply that can be used for power or irrigation during the normal low flow period.

WYOMING—Summer streamflow in most but not all of Wyoming is expected to be well below normal for the 1953 season. On the Green River the 1953 flow is forecast at 52% of normal, the least since 1940. Since irrigation along the Green River is limited to mountain meadows local water supply should be adequate.

Although inflow to Seminoe reservoir on the North Platte will be much less than normal in 1953, adequate irrigation water supplies in eastern Wyoming and western Nebraska are assured for this season. As a result of above normal flow the past few years there are now stored in the four major reservoirs along the North Platte in Wyoming 1,600,000 acre-ft. This is practically the same as a year ago but well above the average. The reservoirs were nearly at capacity at the end of the 1952 snow melt season but were reduced substantially because of high irrigation water demands in the summer months of 1952.

On the Laramie River and other smaller North Platte tributaries irrigation water shortages may be expected because carryover storage is not available. The 1953 snow pack over the Wind-Big Horn River basins averages 75 to 80% of average. Those areas operating under reservoir - regulated streams should have a fair water supply for this coming season, but farm areas depending for water upon unreservoired streams can expect late season shortages. Water users in western Wyoming along the Snake and its tributaries are assured of an average water supply although reservoir storage is 6% below normal.



Aerial snow survey is made by photographing crossbar markers from low-flying plane. Snow depth is read from number of exposed bars

High-altitude general views give an over-all picture of snow conditions for the entire watershed. Circles indicate location of markers

Snow Surveys Made on the Wing

The techniques of making aerial snow surveys by airplane as used by the Southern California Edison is clearly shown by the accompanying photographs. Tall stakes with crossarms every 2 ft are erected at selected points on high-elevation snow courses. A commercial plane, hired for the purpose, flies over the course at low altitude and photographs the stakes. Back in the office, Chief Hydrographer W. A. Lang counts down from the top of the stake the number of crossarms in view. Knowing the number of arms on the stake, snow depth is quickly computed. A survey is that simple.

The upper picture to the left shows one of these stakes with seven arms showing. Snow depth here was approximately 2 ft. View at upper right is same stake with only one arm showing, indicating a snow depth of approximately 13 ft.

The two lower photographs are general views of the Emerald Lake area in the high Sierra of central California on one of the watersheds supplying water for Edison's Big Creek hydro plants. Location of the snow course in this area is indicated by the circles. Snow surveys are made by the aerial technique in a matter of hours instead of the days and weeks formerly required.

The California Electric Power Co. has been experimenting since 1949 with the aerial survey method on its Bishop Creek, Rush Creek and Leebining watersheds with promising results. Similar work is being done also by the State Division of Water Resources. A program is under way whereby the markers of all three agencies will be photographed as a group for coordinating results and sharing data.

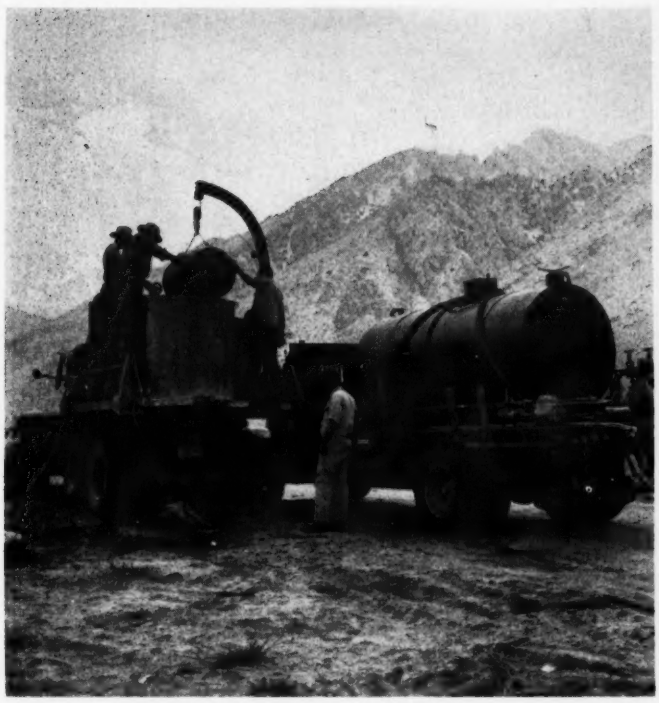
Soil is stabilized by injection of chemical solution into alluvial deposit so that the auger can be used to bore tower-footing holes

Soil Stabilizing Permits Sand Augering

Sodium silicate water and sodium bicarbonate solution is jetted under 100-psi pressure

In the past the Los Angeles Department of Water & Power has constructed high-voltage transmission line tower footings using a design that required undercutting or belling out of the bottoms of tower footing holes. This required considerable work and time in hand labor. Construction procedure of this type was not possible in areas of heavy sand such as were found across some desert terrain during the construction of the 260-mile, 287.5-kv Boulder transmission line. At these locations it was necessary to replace the auger boring operations with clam shovel. This required digging a hole large enough to permit construction of concrete form work for a mass-type footing, because the boring of a hole in sand would cave in quickly.

On the 260-mile Owens Gorge 230-kv line, crossing rugged mountain and desert terrain, preliminary spot field tests indicated considerable amount of sandy areas and alluvial deposits. Design engineers looked forward to a modification in footing design, the possible elimination of the undercut-



Preparing the chemical mix (left). Fine sand beneath overburden as at the right required larger number of injections for stabilizing

ting and belling out of the bottom of the holes and securing more economic construction. A program of footing design modification was initiated and experimental field tests made to permit the simple drilling of the footing hole with a machine auger, thereby gaining considerable economy.

A pole-type footing finally was developed. However, to overcome the difficulty of caving holes in sandy areas it was necessary to develop a process of stabilizing sand long enough to permit augering the hole, setting the template and the reinforcing steel cage, and pouring the concrete. Working closely in collaboration with representatives of the Philadelphia Quartz Co. of California, experimental field tests were conducted. From these tests were developed the proper chemical solutions and concentrations as well as methods of application and injection.

The tests indicated that a mixture containing 29 parts by volume of "N" sodium silicate, 145 parts water and 68 parts of a water solution containing 6.6 lb of sodium bicarbonate per 100 lb was most effective and desirable. The solution is injected by jetting under pressure of approximately 100 psi in a number of injections forming a circular pattern about the center of the tower footing. The quantity of solution per foot of depth depends on diameter of hole. After the injections have been completed the ground is left undisturbed for several days before augering operations are started.

Equipment necessary for the preparation and injection of the chemical solution together with two 200-gal tanks for preparation of the sodium bicarbonate solution, a 250-gal mixing tank and air-operated piston pump were mounted on a 6x6 truck. The truck also carried additional sacks of sodium bicarbonate, drums of sodium silicate and injection pipe needles. A 300-gal tank trailer was towed in order to furnish water to the job while the large water tank truck was away. Another 6x6 tank truck with 1,600 gal capacity brought water from available sources to remote locations on the job. Additional barrels of sodium silicate and sacks of sodium bicarbonate were carried on the truck. This truck also towed a 105-cu-ft compressor from tower-to-tower location as required. All of this equipment covered the entire 260 miles in the performance of this work and was self-sufficient to the extent that it required only replenishment of the chemicals by truck from Los Angeles.

This process of soil stabilization, however, is not practical when wet sand or ground is encountered. The additional moisture or water in the ground weakens the chemical solution and as a result it does not gel properly. In the reconstruction of another transmission line along a river right-of-way, caving of the holes was experienced because of excessive water encountered. The ground was a combination of a clay overburden with a very fine sand and silt underneath. After augering a hole water would seep in, and in a few hours the hole would be half full of water. The soil stabilization process was tried but, because of the fine silt, pressures up to 200 psi were used in order to inject the chemical solution. Because of the excessive water the solution did not gel and consequently another method was used to keep the walls intact while pouring the concrete.

Preliminary estimates made from spot footing tests in the field on the Owens Gorge line indicated that about 10% of the 1,274 towers would require soil stabilization. However, because of a later change in the route and the resulting change in terrain, the actual number of towers stabilized was closer to 30%. In many locations the tower sites were misleading on the surface as to the composition of the soil. After the auger had penetrated the first 18 in. to 2 ft of overburden, heavy sand would appear and further augering of the hole would be fruitless until soil stabilization process had been effected.

From the best information available, this appears to be the first time that soil stabilization by the use of chemicals has been utilized for the purpose of augering tower footings on transmission line construction.

Locating television interference requires same techniques used in finding radio noise

Field-strength test is first step in investigating television interference. In a primary service area there should be at least 500 microvolts per meter for good reception

Some Pointers on Television

Ever since the beginning of radio broadcasting, the subject of interference to the reception of radio signals has been a matter of concern to radio listeners, manufacturers, dealers and power utilities. Interference comes about because electrical discharges are produced in the atmosphere by atmospheric electrical disturbances such as lightning, sparking of electrical equipment contacts, etc. A radio receiver is not able to differentiate between a wanted and unwanted signal, if the unwanted signal (interference) happens to radiate energy at the frequency to which the radio receiver is tuned. This is because the interfering signals are electromagnetic waves similar to those transmitted by the broadcasting station. In areas where receivers are located adjacent to transmitting stations interference is seldom a problem, because of the relative strength of the wanted signal to the interfering disturbance. The relation of signal level to noise level is referred to as signal-to-noise ratio. This ratio is the determining factor as to whether or not any type of communication circuit can perform satisfactorily.

In the investigation of radio interference cases, many sources and types of interference have been located, and techniques have been developed for their suppression or elimination. Complete elimination of all radio interference is not practicable. However, the application of proper measures will in most cases reduce the noise level to tolerable values.

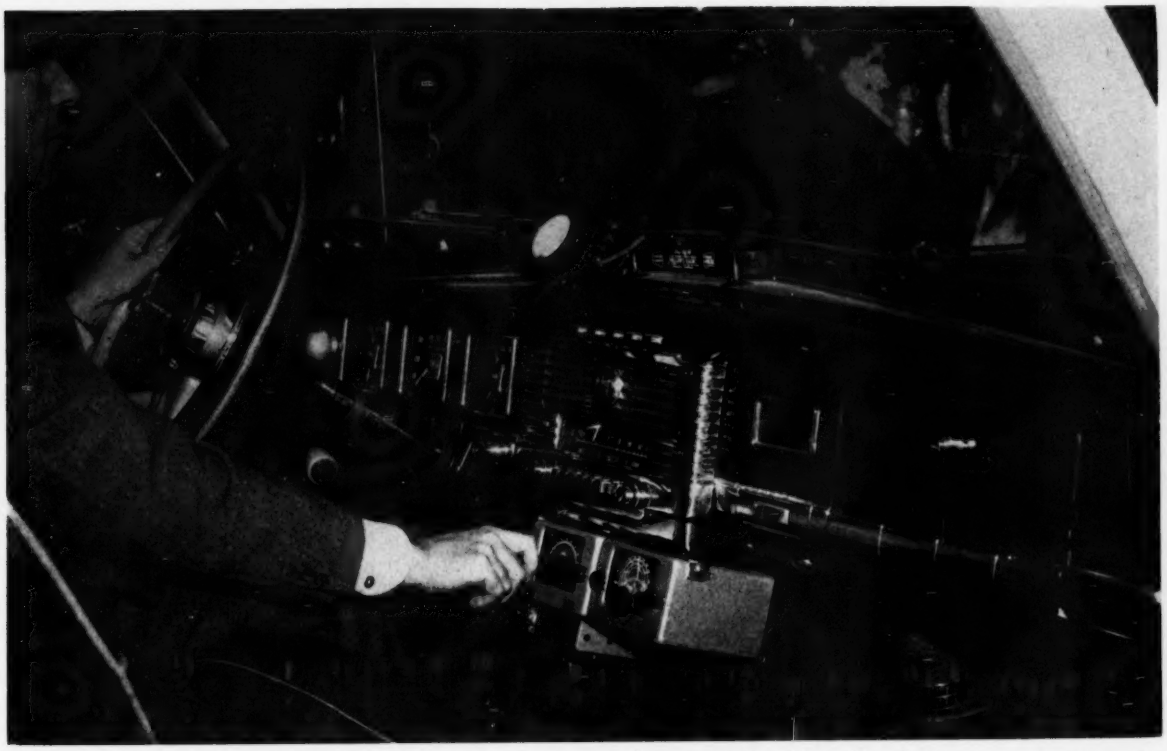
Since most interference is produced by sparking or arcing discharges, it is this type of interference that is considered in this article. No consideration will be given here to interference produced by such equipment as dielectric heating generators, diathermy machines, radio transmitters and in some cases television receivers. These classes of equipment are, in general, operated under regulation of the Federal Communications Commission and although they occasionally may be sources of radio and television interference the majority of cases of interference are produced by sparking devices.

The preceding comments have been general in nature and apply equally to conventional broadcast radio and to television reception. The ratio of signal to noise was previously mentioned as being the criteria for satisfactory reception of radio signals. Although there is no hard and fast line of demarcation between satisfactory and unsatisfactory reception, experience has shown that a signal-to-noise ratio of approximately 20 to 1 will provide satisfactory radio reception. With television reception, much higher standards must be maintained because the eye is less tolerant of disturbing influences than the ear.

Another factor making it necessary to maintain higher standards of signal to noise with television than with conventional radio broadcasting is the tremendous band width required to transmit pictures and sound simultaneously. A broadcast radio receiver must accept a band of frequencies approximately 10,000 cycles wide, while a television receiver must accept a band approximately 6,000,000 cycles wide. This factor is worthy of consideration, because a receiver's susceptibility to noise is proportional to the band of frequencies that the receiver will pass.

An appreciation of the factors just discussed will make more apparent the basis for the requirement of a higher signal-to-noise ratio with television reception than with broadcast radio reception. A ratio of signal to noise of about 100 to 1 has been found to be the minimum necessary for satisfactory reception.

As television broadcasting is still in its infancy, although a rather lusty infant, it is currently beset with growing pains similar to those that radio broadcasting went through in its early years. There is a lack of understanding as to the causes of interference and attempts to oversimplify the problem by unidentified experts, who have originated the leaky insulator, the leaky transformer or the radio amateur (ham) as the general causes of all interference. Actual field investigation of many cases of interference by power utilities and radio interference investigating agencies has shown only a small percentage to be caused by insulators, transformers or radio ama-



Elaborate test equipment is not necessary if field man is experienced. Here on the dash of the author's sedan are mounted an ordinary car radio with audio output meter, a tuner for video, audio TV and a short-wave tuner. Ordinary car antenna is used

Interference

Fred R. Roe
Northern California Electrical Bureau
San Francisco

teurs. All of the items mentioned can, in certain situations, be producers of interference but their role is minor. The radio amateurs, in self-defense, have established TV interference committees to investigate cases alleged to be produced by operation of ham radio transmitters and are doing an excellent job in this respect.

The major burden of location of radio interference sources has, in general, been carried by the electric utilities. This is true even though experience has shown most interference results from operation of appliances, rather than from the utility plant itself. Modern utility standards provide measures to minimize interference, for example, by the use of radio-treated insulators, careful bonding and adequate separation of items of pole-top hardware. Proof of the effectiveness of these measures has been demonstrated repeatedly by the satisfactory operation of television receivers in close proximity to energized, high-voltage power lines.

With the advent of television, lack of experience on which to base conclusions brought about several schools of thought on the subject of TV interference. The most optimistic thought that with the very high frequencies used in television broadcasting there would be no interference. Those more pessimistic felt that because of the tremendous band widths required there would be a great deal of interference. Experience has proved that the situation was not so good as anticipated by the more optimistic or so bad as predicted by the pessimists.

Appliances Are Chief Offenders

Experience with television so far indicates, as in the case of radio broadcasting, that appliances are more generally interference producers than are power lines and associated equipment. However, in some cases interferences that did not show up in broadcast reception have affected TV receivers. It is possible, for example, for an interference source to generate only a narrow band of frequencies, so that one TV channel will be affected but the disturbance will not appear in other portions of the radio spectrum.

In all electrical systems there are elements of inductance and capacitance, as well as resistance. It is the combination of these elements that determine the frequency of operation of the tuning circuits in any radio or TV receiver. Consequently, when considering power circuits the length of wires, spacing, converted equipment, such as transformers and hardware, present a practically infinite number of combinations. It is, therefore, possible to have portions of a circuit tuned to a very narrow band of frequencies or in other cases to a very wide band.

Another complication of the interference problem is the possible presence of harmonics of interference sources. For example, with a source of energy operating at 1,000 kc, multiples or harmonics of this frequency can occur at twice, three times, four times, etc., of the 1,000-kc fundamental. As such harmonics may be high order multiples of a source of interference they may show up in the TV bands. In most cases of sparking discharges the radiated interference is usually made up of a fundamental

Three steps in locating trouble are: from left to right, checking antenna, testing out services to see if interference is coming from one of them and jarring pole with sledge while listening to the car radio to see if there is any change in interference sound

and many harmonics. It can be seen, therefore, that interference can manifest itself in many ways; for instance, radio only, TV picture only, TV sound only, TV picture and sound, radio and TV sound, radio and TV picture, and radio and TV picture and sound.

Because of the many possibilities for interference to television reception being produced by other than power system equipment, many utilities have adopted the policy of accepting TV interference complaints only after they have been investigated by a television dealer or service organization and determined to be resulting from the operation of power system equipment.*

The complexity of the interference problem is brought about by the large number of possible sources of interference and also by the fact that the symptoms on the television receiver may be the same for several different types of noise sources. Over years of experience with the investigation of radio interference many sources of interference have been identified. With television, experience has not yet provided a comparable degree of information. However, a few of the so far identified and potential sources are arcing thermostats, relays, neon and fluorescent lighting, sign flashers, street railways, violet ray equipment, germicidal lamps, automobile ignition systems, traffic signals, loose tie wires, loose bond wires, loose fuse, pole-line hardware with inadequate clearances, crossed guy wires, and crossed primary and secondary leads.

This list contains only a few of the possible sources of interference, but is representative of the general types to be expected. Because of the large number of appliances in service, which can be producers of interference, utility sources are in general in the minority.

*This is the policy in Pacific Gas and Electric Co. territory. In the San Francisco Bay region TV and radio interference is handled by the Northern California Electrical Bureau, the industry's educational-promotional organization.

Experience Required

It can be seen from the foregoing discussion that the location of interference sources is often a difficult and time-consuming process. There is no substitute for experience in such work, as different sources will produce effects that, to the uninitiated, appear to be identical. In some cases an experienced investigator can identify the interfering signal by difference in sound, even though the appearance on the picture tube of a TV receiver will be the same for several types of interference.

An engineering analysis of interference and its sources requires complex and expensive equipment. However, in most cases the identification of a source can be accomplished with receiving equipment capable of tuning a wide band of frequencies from broadcast, through short wave and the various TV bands. It is premature to comment on the ultra-high-frequency television interference problem, as there is at present insufficient experience on which to base conclusions.

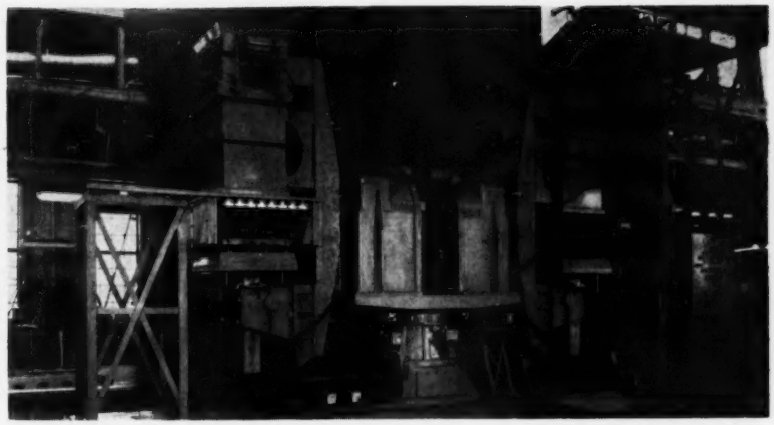
Comment was made earlier on the fact that a signal-to-noise ratio of at least 100 to 1 was necessary for satisfactory television reception. Because of the line-of-sight properties of radio waves in the VHF-TV band as are used by the TV stations operating on channels 2 through 13, and even more so in the UHF band now being allocated, the usual effective range of a television station is in the order of 40 miles. At greater distances, or where intervening terrain prevents line-of-sight paths, reception is usually erratic. In fringe areas small amounts of interfering signals or voltages will affect reception whereas in stronger signal areas the same amount of interfering signal would not affect reception. It is in these fringe areas where the interference problem is most difficult of solution. The problem is comparable to the early radio broadcast days where many listeners attempted to receive signals at great distances.

It is anticipated that with the lifting of the freeze on television stations and with the placing into operation of new stations so that usable signals are available to more television receivers the interference problem will be minimized.

In summing up, it can be said that, as in radio broadcasting, the successful operation of television receivers is primarily dependent on an adequate ratio of signal to noise. However, with television this ratio should be much greater than for broadcast radio reception. Many sources of interference have been identified and they are mainly from appliances with sparking contacts of some sort, although power systems can produce interference if not adequately maintained. In general, the methods effective for reduction of broadcast radio interference are also effective for television. However, in the location of television interference sources the investigator must be provided with equipment capable of tuning through the television bands, because interference in some cases may not appear in other portions of the radio spectrum. Last, but most important, the investigator should have an adequate knowledge of the problem and sufficient experience to interpret properly the symptoms to determine whether or not the interference is produced by appliances, power equipment or other devices, and to determine the proper corrective measures for its alleviation.

PROMISING NEW LOAD IN SHELL MOLDING

Lewis B. Reed
Industrial Heating Consultant
Los Angeles Department of Water & Power



The Croning process is hailed as greatest innovation in foundry practice in centuries

Our postwar technical research teams in Germany found the Germans had been using a process during World War II that promises to do more to upset foundry practice than any other innovation in centuries. The process is known as the Croning Process, or "C" Process, though it is now becoming better known as shell molding. The process has many advantages, both practical and economical, which appeal to alert foundry men. It is already in production use in several eastern foundries, with the Ford Motor Co. apparently the biggest user of shell molds.

Aside from mechanizing their handling problems, few changes have been made in foundries for many years. It might even be said that foundry men appear to resist change, and prefer to say foundry work is an art that has been developed over many thousands of years. Shell molding will change thoughts like that, and it is very possible foundry men who do not make the change to shell molding will not be in business in a few years. The process is just that good. In fact it has been stated that shell molding is the only really new change in foundry practice in several thousand years.

New Power Load

To the electrical industry it means more than cheaper and better castings. It means added horsepower because many hand operations will be done by automatic machines. It also means added kilowatts of industrial heating load, since at least half of the automatic shell molding machines on the market today utilize electric heat for the very necessary heating cycles.

Naturally development work is going to be slow. The foundry industry is not accustomed to making radical changes, and it is going to take time to consider all aspects of the change. Department of Water & Power industrial heating consultants were engaged in development work with one of their customers on shell molding in 1949. The results at the time were extremely encouraging, yet no known Far Western foundry is yet using the shell molding process for extended production use. It can be said, though, there is every possibility that automatically controlled electric heating of patterns will become standard practice.

Process Described

Briefly stated, the process consists of the following steps:

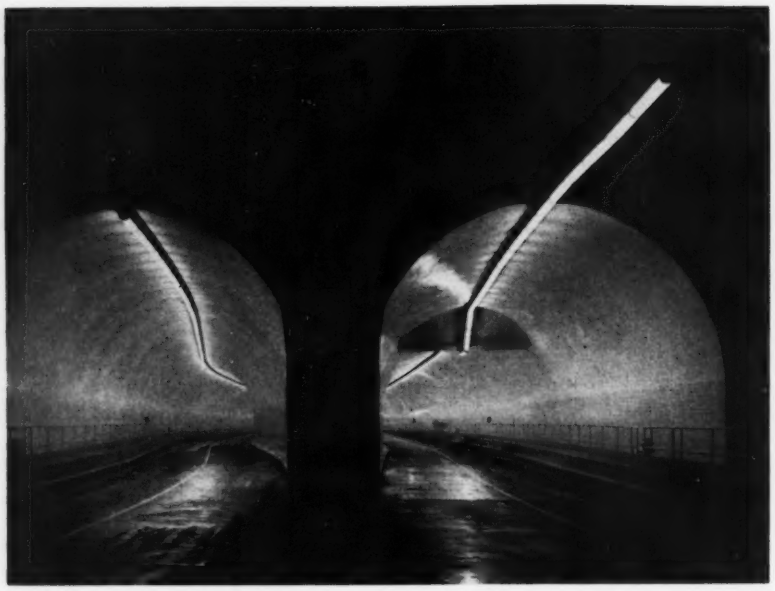
1. A mixture of very fine sand and about 5% phenolic resin by weight is prepared.
2. The molding machine is loaded with the mixture. Basically the loading machine is a bin, or large bucket, which can be quickly inverted.
3. A pattern plate heated to 400 F is sprayed with a parting agent, then clamped to the open side of the bin. Patterns need good mechanical strength, and should be made of metal, which is a fair conductor of heat. It will need to withstand temperatures of 400-500 F for indefinite periods, and 700-800 F for short periods. Allowances must be made for pattern expansion and shell shrinkage.
4. The bin is quickly inverted, allowing the mixture to drop 6 to 8 in. onto the hot pattern plate. The bin is held in the inverted position about 20 seconds, then rotated to its original position. This leaves a crust about 3/16 in. thick clinging to the pattern.
5. Pattern plate with crust intact is removed from bin.
6. Pattern and plate are heated to 675-725 F. Curing time is about 30 seconds.
7. The cured crust is stripped from the pattern by use of ejection pins. Cured mold surfaces are hard, smooth, with a glassy feeling to the touch.
8. Two crusts make one mold, each half being made on a separate pattern with provisions for indexing the two halves. The crusts are clamped or cemented together, placed into a box, and backed up with ⅛ in. steel shot. The mold is ready for pouring.

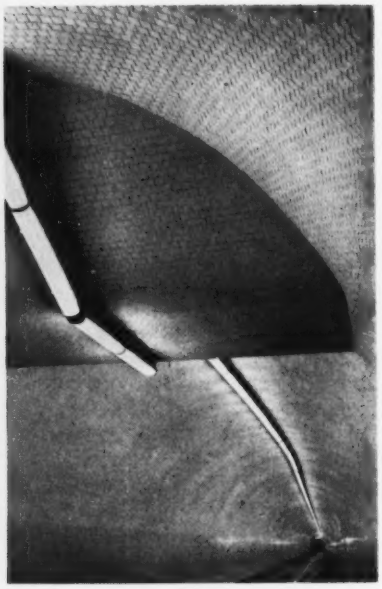
Advantages

Shell molds are easily handled, have high mechanical strength, and can be stored for long periods. The casting surface is very smooth, can be made to close dimensions, and will reproduce exacting detail. Each of these features is the exact opposite of conventional sand molding. Shell molds require less sand, though the cost of binders is still considerable. Shell moldings will hold together long enough to be usable in casting all metals now cast in foundries, including stainless steel. Shell molds are permeable, which permits gases to escape rapidly during metal pouring. This self-venting, plus a dry mold, corrects two major foundry problems, blow in castings and friability during knockout. With closer tolerances and smoother surfaces, shell mold castings cut finishing costs considerably.

To the foundry man shell molding means reduced labor costs. Automatic machines on the market now will produce a mold every minute and a half per station. Ford Motors use rotating machines with six stations that produce 240 molds an hour. Increasing the efficiency of the foundry means reducing labor costs, reduction in space requirements, reduced time in making a casting and an increase of pounds output per ton of metal poured.

Shell molding machines are going to make foundry operators more electric minded. The day may come when the all-electric foundry will not only be desirable but economically practical.





Long continuous rows of slimline fluorescent lighting fixtures in San Francisco's new Broadway vehicular tunnel provide . . .

Pleasing, Adequate Tunnel Lighting

Merrill R. Humber

Humber & Walker Co., San Francisco

First award winner for northern California and at Los Angeles regional IES meeting in "interesting lighting job" competition

That a long vehicular tunnel need not give a motorist the feeling of being confined or of driving through a series of light barriers was proved recently when the Broadway tunnel through Russian Hill, San Francisco, was opened to traffic. Yellow tiled walls and long continuous rows of slimline lighting fixtures give a sense of spaciousness and airiness.

This effect is the result of one and one-half years of work. In the early stages, Harry C. Vensana, then director of public works, Ralph G. Wadsworth, city engineer, and Sherman P. Duckel, now director of public works, decided that the use of a lineal-type light source was particularly adaptable for the illumination of tunnel interiors. The efficiency of a fluorescent light source, the low brightness of the lamp, the continuous effect of the units mounted end-to-end would light the tunnel effectively without the usual annoying repetitive effect of light and dark areas usually associated with tunnel interiors, they believed.

Two other tunnels to be lighted with lineal sources were in progress at that time: (1) The Brooklyn Battery tunnel, New York, that used a combination cold cathode-slimline system with two rows of single-lamp units mounted on either side of the individual bores. (2) The Pasadena tunnel, Pasadena, Tex., using a single line of two-lamp fixtures running along the crown of the tunnel bore. Each fixture was self-contained and enclosed in a plastic diffusing cover.

Both tunnels were under construction. Therefore, final results on either lighting system could not be evaluated. Further, since the consulting engineer on the Broadway tunnel was the same engineer as for the Brooklyn tunnel in New York the unit system and the unit type as used in New York were specified.

The Specified Unit

The specified unit used a 1-in.-diameter lamp, 6 ft long. Each pair of lamps was placed end-to-end and enclosed in a 12-ft Pyrex tube, sealed at both ends. In between each 12-ft section of glass tubing was a cast bronze housing holding some of the auxiliary equipment. Further auxiliary equipment was to be installed in niches recessed in the wall of the tunnel bore. This unit was specified and bid upon in the original bid.

Unit Substituted

After many conferences with city engineers and officials it was decided that the alternate unit offered features that were more desirable to the city and, further, installation costs could be reduced. The low bidder on the electrical subcontract, George F. Brayer Co., San Francisco, was contacted and asked to submit a figure to the city through the general contractor, Morrison-Knudsen Co. Inc., giving the cost differential on the system used in the Pasadena tunnel, Texas. A substantial saving was passed on and the order for the lighting fixtures was placed with the Sunbeam Lighting Co. of Los Angeles through the California Electric Supply Co. of San Francisco.

Installed Units

The Sunbeam fluorescent unit is completely self-contained and designed to be installed on the apex of the tunnel cross section by means of conventional nuts, bolts and securing devices without special isolated ballast recesses or niches. A special wire raceway was designed that would carry all of the

Three stages of illumination provide a gradual decrease in intensity as motorists drive through the tunnel during daylight hours

feeders and circuit wires necessary to light the units and which, when installed, would form an integral part of the fixture body. Both fixture and wireway were so constructed as to allow continuous interconnection between fixtures without separate conduit or wire-enclosing ducts. Provisions were made for small irregularities or deviation on the mounting surfaces of the tunnel.

Structural Characteristics

The fixture is completely enclosed with all major adjoining parts and surfaces gasketed to prevent water seepage. Fixtures are constructed of four major elements:

1. Continuous wireway. This is made of 14-gage, cold-rolled steel, die formed and cadmium plated after fabrication. All outside screws and nuts on the wireway are also cadmium plated over brass. Drip flanges are formed on the bottom of a three-sided wireway to carry water down over the fixture body. Each wireway is provided with an excess panel 4 in. deep along the entire length of the unit. The top surface has three 9/16x2-in. slots spaced 25 in. apart, one centered and two on either side of the center line, enabling the quick and easy mounting of the units to the Unistrut No. P-200 with concrete insert flanges embedded in the concrete pour. Slots running across the channel allow for alignment of units either in a straight line or in the curved sections.

2. Backplate. It is constructed of 63S-T5 extruded aluminum ⅜ in. thick, approximately 10 in. wide and 75 in. long. Edges extend downward and outward and act as a guide for moisture that might collect on the upper surfaces. Holes are provided for easy passage of wires into and out of the wireway from the fixture proper. This backplate is reported to be one of the largest aluminum extrusions ever formed.

3. Enclosed inner structure containing lamps, ballasts and reflector. All ends and joiner castings are of aluminum with provisions for interconnecting fixtures. Castings are especially designed to prevent water seepage and are bolted to fixture backplate with standard bolts and support strips. Ballast equipment is covered with an aluminum reflector also serving as raceway for interconnecting wires of the fixture. The reflector was cadmium plated after fabrication and before painting to resist corrosion.

4. Enclosing, diffusing and sealing element. The diffusing panel is extruded Lucite approximately 74 in. long with a nominal thickness of .100 in. Panels are corrugated on the interior of the panel for light diffusion and brightness control and smooth on the exterior surface for easy cleaning. Plastic panels are firmly held in place by longitudinal runners of extruded aluminum. Plastics are fitted into a vinyl plastic gasket between the diffusing panel and the extruded rails making a water-tight fit. Diffuser panel hinges down for easy maintenance by loosening the two large wing nuts per unit, mounted on the side of the backplate.

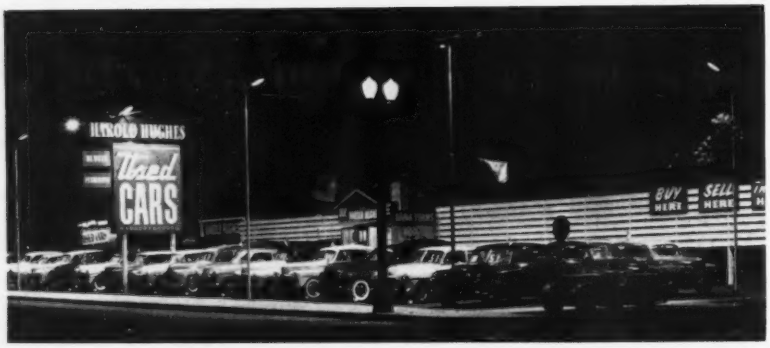
Sola ballasting equipment is used in the fixtures because of low wattage loss in the ballast and because of its light weight. All units were equipped with two T8 72-in. lamps burning at 120 ma. In the first third of each bore, one extra T12 lamp burning at 430 ma was added to each fixture. In the middle third of the bore one extra T8 lamp burning at 200 ma was added to each unit. This allowed three stages of illumination, a gradual decrease in illumination, as the motorist drives through the tunnel during daylight hours. All units operate with two T8 lamps at 120 ma during hours of darkness.

Lighting intensities were taken after the tunnel opened, although all lamps had burned approximately 1,000 hours and had reached sustained output when readings were taken.

During daylight hours the entrance third of each of the twin tunnels is lighted to an intensity of 26 f-c, the middle one-third 22 f-c and the exit one-third 13 f-c. In the evening the lighting automatically changes to a uniform intensity of 13 f-c at the roadway.

Low brightness of the units allows motorists to see right through the 1,616 ft of tunnel without any attending glare.

There have been few tunnel jobs throughout the United States lighted by lineal light sources and since there is so little information available conferences with all persons involved were particularly important. Certainly the finished job, with its pleasing effect of soft colors, comfortable lights, straight lines and smooth curves, proves that cooperation and coordination justified the efforts of all who worked on it.



Used cars are merchandised with light. This relighted car lot has intensity of 100 f-c

Used Car Lot Relighting Starts Chain Reaction

Roy E. Dahlin
Coordinator of Lighting Development
Southern California Edison Co.

When a used car dealer in Santa Monica floodlighted his car lot to an average intensity of 25 f-c with 50 f-c on a 20-ft strip adjacent to the sidewalk, he started a chain reaction that brought about general relighting in the neighborhood. The installation consists of 17 S & M Lamp Co. No. 1052 CA floodlights with 1,500-w lamps mounted on 24-ft poles 37 ft apart. Fifteen-hundred-watt lamps were used since they are much more efficient than a multiple of smaller bare lamps. It will be remembered that one 1,000-w lamp produces as much light as do 13 100-w lamps.

This type of lighting for a used car lot is far superior to streamers of small lamps and is sweeping rapidly over the Los Angeles area. Advertising benefits of the new lighting have been pronounced and with an operating cost of only 63.6c an hour the lot superintendent's enthusiasm is understandable.

The interesting thing is that following this installation several other requests were received in the general territory and floodlighting of used car lots became quite the standard practice in that area. After a number of the used car lots were lighted, the businessmen became convinced of the sales benefits to be derived from high-intensity lighting and a local businessmen's organization resulted for the promotion of their business area.

Following a number of these excellent lighting installations, the Edison company has had requests for improved street lighting in the territory. By comparison with the amount of light in the car lots, the present street lighting is inadequate. This may be seen from the accompanying photographs.

The floodlighting job described was designed by Robert Ford, lighting consultant in the Santa Monica office of the Southern California Edison Co. E. L. Swearingen, NECA contractor in Santa Monica, made the installation.

Community TV

In areas not covered by television stations it is certain public pressure for reception will be great, stated J. R. Dowling, Portland General Electric Co., at the recent Portland meeting of the Northwest Electric Light & Power Assn. In shadow zones the most promising means of providing signal coverage appears to be community television (CT).

In the service area of Portland's single TV station there has arisen great interest in CT. Community television systems generally operate from signal reception at a high point, amplifying and distributing this signal by means of a coaxial cable, which would have to contact utility poles.

Average fee charged by systems presently in service is $175 for connection plus a monthly charge of $3.75. The electric utility is naturally interested in CT from the revenue as well as the public relations standpoint. Present contact charge for contacting utility poles in the Portland area is $3.50 per pole-year, payable in advance. Performance bonds, ample insurance and qualified linemen will be prerequisite to installation. Each amplifier (about 1,000 w) is to have a separate meter where on PGE lines, with possibly a $5 monthly rental plus energy charges.

At present there are four CT systems planned in PGE's territory, two in Portland in shadow areas of the UHF station and two in Hillsboro, 15 miles to the west.

ELECTRICAL WEST Contractors' News Letter

QUICK NEWS ON TRENDS, LAWS, CODES, MATERIALS, EQUIPMENT, COSTS, WAGES, ETC.

What price glory

Whether it is on the program or not—and it isn't likely—the hot topic at both the National Electrical Contractors Assn. District 6 meeting at Vancouver, B. C., May 7-9, and the District 8 meeting at Billings, May 15-16, will be welfare. It is hotter in the coast region than in the mountain states because already a reaction has started there. Building business isn't too good for many, and the union bench is warmed by job seekers. A large proportion of the house wiring business is going nonunion. It doesn't make much sense having a high wage rate with welfare fringes if there are no jobs.

Think again

Most notable change of attitude came from the AEC which up to now has been a pushover for every wage advance and extra thrown at it. This has caused havoc on civilian work by jacking up area wage rates, which the government agencies would pay, to a point the lay public couldn't take it. At Arco, Idaho, the AEC told the electrical contractors and union it would not pay the advance in scale and portal-to-portal travel pay which the union had won recently from the Council on Industrial Relations. Told the contractors and union to go back into negotiations and come up with the old scale or else. So it has been reopened.

Do they mean it?

Contractors wonder if the government will really get tough and can they depend upon it. They did not want the last boost either but were stuck with it. There is even talk that the unions may be willing to consider a lower residential scale to try to woo back some of the house wiring from the nonunion side.

But on the coast the welfare issue is still boiling. Los Angeles NECA and unions settled for 10c an hour in lieu of welfare, making the journeyman rate $3.10 an hour. Also in the agreement is an hour pickup time for tools, a $25 deposit for pay roll guarantee, a clause requiring contractors to label their trucks. (Evidently don't trust some operators to pay their wages; fear unlabeled trucks may bootleg wiring.) The 10c raise is "earmarked in lieu of any and all welfare benefits."

Deadlocked

Oakland and Contra Costa County cases may be taken to the council again, and so may Sacramento's, as no agreement has been reached between NECA chapters and IBEW locals. Nothing has been settled in San Francisco either. All are asking for a pay raise as well as health and welfare.

Fence goes down

California's Supreme Court ruled last month that no registration fee is necessary for any contractor to operate in any city so long as he has a state license. Cities can only charge a business license for revenue, not require the high yearly license which used to prevail in many cities to discourage new contractors from starting. A few years back the examination was ruled out by the courts for electrical and plumbing licenses.

Oil on troubled waters

Western Gas & Oil Assn. representatives met with Charles Smith, IAEI secretary and NFPA field engineer, to discuss National Electrical Code and California Safety Orders differences. Smith urged the three oil associations, WG&OA, American Petroleum Institute and the Texas association, all wanting different things in the code, to get together and come to the NFPA with definite and reasonable proposals for changes. Resolve their own differences first, then they'll get somewhere.

Greek meets Greek

The NECode, Smith also announced, was recently translated into Greek by Frank Thornton, retired Westinghouse code representative for NEMA. To many contractors and wiremen here it was already Greek. After that job Thornton is to try to straighten out some of the English in the code so the Americans can read it.

Swell guy

Nick Siggins never made it to the retirement he was looking forward to. The well-loved old-timer electrical inspector in San Francisco died of heart failure, aged 64, April 15. He had been in apparent good health. Nick never quite made chief inspector either, a post his friends all felt he should have. But he made a multitude of friends who mourn him.

List subs

Idaho's legislature, largely due to the work of Claude Detwiller of Twin Falls, enacted an amendment to its state code to require the naming of subcontractors under contracts of public works requiring plumbing, heating, air conditioning or electrical work. Similar laws are now in effect in other states. In California the general contractors have been trying to get it repealed. This is essentially what the NECA is asking the U. S. Congress to enact for federal work under S. 848. The AGC is fighting it, although many of its better members favor it too.

Not too bad

Defense construction won't be cut as much as some feared. The review is about completed and some of the projects are opened up again for work. Deepest cuts are apt to come in the Bureau of Reclamation budgets for power plants. Some of the frills may be trimmed from the military posts. It also appears that the pace will continue for another year. Building permits for civilian work in the West touched an all-time high in March, in 288 cities and counties an increase of 29% over a year ago and valuaton 56% higher. The one thing that seems to be eliminated is mass housing by the government. The unions are protesting this vigorously, claiming low-income people can not afford present rents. The issue is still before Congress. All would seem to point to active building construction, even though it has been quiet in the West in April.

Line merger

Biggest manufacturer news is that Benjamin Electric Mfg. has purchased Leader Electric. This will give Benjamin a Western plant in Oakland where Leader has been established for some time. The Leader production will carry a Benjamin-Leader line designation.

Not explosion-proof

Appleton Electric has been undergoing quite a shakeup with Art Appleton out at the top and prior to his leaving dismissal of several executives, among them O. Fred Rost, former editor of Electrical Wholesaling. Word is the reorganization is being accomplished and announcements of new management will be made soon.

Scotched

There is only one Scotch tape and that's made by Minnesota Mining & Mfg. Co. A writ of perpetual injunction prohibits the misuse of the names "Scotch" or "3-M." Gerald Rice and G. W. Blake were doing business as MMM Industrial Division, using trade names of MMM and Econoscotch. U. S. District Court in southern California issued the injunction.

Light on schools

Research will be done on schoolhouse daylighting under a grant by the Pacific Coast Electrical Assn., the board of directors of that organization finally decided at its recent meeting. President Smalley appointed a special committee consisting of T. L. Rosenberg, chairman, John Walsh, Ralph Crump, Stephen Lindheim, George Hawley. With a tremendous school-building program under way getting accurate data on electric vs daylighting is highly important to the industry.

Two in Pocatello

Pocatello has a new electrical supply distributor. Irvin "Pete" Greenleaf, formerly of Afton-Lemp, Boise, and previously G-E Supply, recently with C. L. Lewis, contractor, and Ben Davis, Pocatello attorney, are proprietors of Industrial Distributors Inc. at 1710 N. Main, Pocatello. Busines will be confined to wiring supplies and industrial electric equipment, carrying stocks of transformers, motors, starters and controls, pole-line hardware, wire and fittings. Will have the Sylvania lamp and fixture line. Pocatello already has another wholesaler, Electrical Contractors Supply Co. Industrial growth of the region is extensive.

Package for islands

Nu-Art Lighting & Mfg. Co. of Salt Lake City is featuring now a pump island light for service stations that has found considerable favor among oil companies. The reflector uses a stair-step design, which improves the light reflection. The fixture comes as a solid unit, installable in a few minutes, to save time and money. Nu-Art has wholesaler outlets throughout the Western states.

Fartherest north

An Alaska chapter of NECA has been started. Previously Alaska contractors belonged to the Puget Sound Chapter in Seattle, but that was far away. Its headquarters will be at Anchorage and Robert W. Marsden is its manager. Officers are Percy Bergt, Pacific Electric Construction Co., Anchorage, president; Robert Grosclose, City Electric Services, Fairbanks, vice-president; August Sundstedt, Pioneer Electric, Anchorage, treasurer; and additional directors are Charles Siegel, Hall Electric, Fairbanks; and R. McKinley, McKinley Electric, Juneau.

More growth

Other NECA news—Joe Bollinger, former manager of the San Diego Chapter, has now joined Matt Sherwood, Western director, as NECA field representative. He has been working recently in Nevada to activate the Nevada Chapter with a Reno division, as well as one at Las Vegas. The latter seems likely, according to "Shorty" Reitz of Las Vegas, governor, and Harvey Luce, president . . . The Los Angeles Chapter has established a new division at Riverside with 19 new members.

Fore-thought

A TV antenna ordinance was enacted recently by the Pocatello commission as a protection to the public. A performance bond and public liability are required of installers. The ordinance is administered by the city building inspector. Grounding and lightning arresters are required. Steve Rhodes, one of the commissioners, explains that it is designed to protect the public from fast operators who hit town, make many installations and then leave. High winds and lightning are hazards in the area.

Partners in light

Humber & Walker Co. has been formed by Merrill R. Humber and Warren C. Walker, both previously with L. M. Baxter Co., to handle the Sunbeam Lighting Co. line in northern California from Fresno to Oregon, including Reno. Humber won the "My Most Interesting Lighting Job" contest at the IES conference, describing the Broadway tunnel lighting (see p 88) that features Sunbeam fixtures. He has been salesman for PG and E. Walker was formerly with California Electric Supply in the lighting division, later with Smoot-Holman Co.

New branch

Osborne & Dermody, wholesale distributors of lighting supplies and appliances at Reno, has opened a new branch and warehouse at 1305 S. A St., Las Vegas, placing Stan Broad as manager.

Lamp office

Sylvania Electric Products has opened an office in Salt Lake City at 427 S. Main St. where Tom Holland, representative in that area, will now headquarter.

Inspector changes

Among inspectors—William T. Haws is the new electrical inspector at Provo, succeeding John Fisher, who is now with the Department of Public Utilities . . . Henry Etchemendy is the new electrical inspector at Elko, Nev. . . . W. W. Kline has been appointed Las Vegas County inspector in Nevada . . . Harold V. Krotsch heads a new department of building, plumbing and electrical inspection for Riverside County, where five branch offices are to be established . . . Bryan Harding, electrical inspector at Caldwell, Idaho, died recently . . . Claude Angle, Ennis, Mont., is new secretary of the Montana Chapter, IAEI.

Board named

Seattle's electric code review board, appointed by the mayor, has on it Norman L. Bost, National Electric Products; Leon B. Benson, wholesaler; Dave M. Davis, IBEW Local 46; J. D. Gawne, Seattle City Light; B. A. Travis, consulting electrical engineer; C. D. Casey, contractor; and John Watt, electrical inspector.

One of their own

San Diego is to have an Illuminating Engineering Society chapter. Meeting was to be held May 7 at the Electric Bldg., with a group of Southern California Section officers in attendance to start it on its way. Carlton Thompson has been working actively toward that end with a number of San Diego IES members.

Mountain appointees

Tomic Sales & Engineering of Detroit, makers of Thinwall connectors and couplings, has appointed C. D. Belt & Co., 1921 Blake St., Denver, for Colorado, New Mexico, eastern Wyoming and eastern Montana, and Leonard M. Slusser, 318 Dooly Block, Salt Lake City, for Utah, northeastern Nevada, southern Idaho and western Wyoming.

Seeing is believing

Unistrut Products Co. is taking to the road with a station wagon equipped as a rolling exhibit. It will bring samples of its bolted framing system and accessories to contractors throughout the country. A fleet of these is to launched soon.

Bundling with tubes

Claiming several significant improvements in electrical metallic tubing, the Nikoh Tube Co. of Chicago made a feature of this to show the NAED convention and trade show in Chicago, May 24-29. Not only are demonstrations to be made to show improvements in the "Colorline" EMT but a new bundling technique to ship the tubing is to be featured.

From Phoenix

Ed Leavy takes the place of the late Sid Cooper as manager of the Graybar house in Salt Lake City. Leavy, like Cooper, comes from Phoenix where he has been the operating manager of Graybar there.

New agent

Electric Corp. of California, 110 W. Alameda, Los Angeles, has been appointed a Westinghouse Electric Corp. agent-distributor to sell apparatus such as motors, controls, transformers, switchgear, lighting equipment, etc. Territory franchise includes Los Angeles, San Luis Obispo, Kern, Inyo, San Bernardino, Orange and Riverside Counties.

Target

Fourteen bills have been introduced into the 1953 California Legislature to amend the contractors' license law. To date none of these has been acted upon.

Appointed

Panama Lamp & Commercial Co. has been appointed representative for the Wilson's Luve-Tile, made by J. A. Wilson Lighting & Display Inc. of Buffalo. The material is a plastered louvered light transmitting in tilelike sizes for use in louvered ceilings or light panels. The line also includes hanging equipment and fittings.

People—changes

Some people you may know—Ken Moulton has been made manager of G-E Supply's 20,000-sq-ft office and warehouse at Long Beach . . . Frank Gregg, formerly with E. A. Wilson Co., now has a new company—Davis-Gregg Co.—representing electronic and chemical process equipment . . . Joseph Liner, branch manager of Rodale Mfg. and Chester Cable Corp., has a new location at 338 E. 2nd St., Los Angeles . . . Ed Byers, formerly with Gough Industries, is now with Standard Wholesale Electric in Los Angeles as sales manager . . . W. B. Baker, electrical contractor, San Francisco, has opened a branch in Marin County at 811 A St., San Rafael, with Al Davis as field manager.

. . . and changes

Ad Woolley, Mountain Electric, Pocatello, is buying Gem State Electric at Idaho Falls from Russ Morton and his brother . . . Robert Ford, formerly Southern California Edison, and Mel Fenton of Graybar, Sacramento, are now with Smoot-Holman Co. . . . Harry Marsh has discontinued Marsh Lighting & Mfg. Co., Los Angeles, and is now with Globe Lighting.

Action speeded

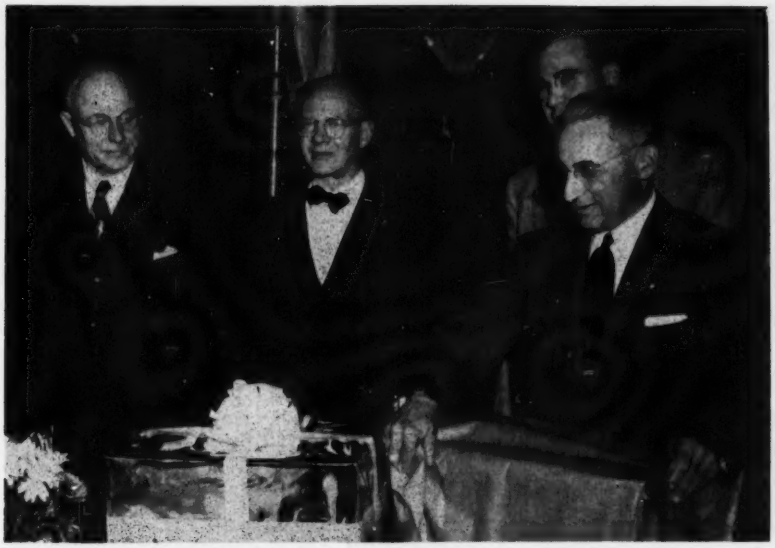
Disposition of pending enforcement actions against violators of price, wage and salary controls before controls were ended is being speeded by the Economic Stabilization Agency. OPS is planning to refer to the Justice Department by June 30 all price cases it deems appropriate for action. The National Enforcement Commission, the body which assesses penalties against employers, was authorized to shorten its notice procedure and to negotiate compromises under certain conditions.

Red Seal homes

In British Columbia, 1,472 Red Seal certificates were issued to homes in the Lower Mainland and on Vancouver Island, reports H. N. Walters, who recently retired as president of the Electrical Service League of B. C. For 32 years increase in Red Seal homes in Vancouver has been higher proportionately than increase in new homes built, he says. Thirty-six apartment blocks, containing 387 suites, and 36 duplex buildings also were granted Red Seal certificates. Outlets total 5,636.

Wins award

Octopus in the House, a 16-mm movie produced by National Electric Products Corp. and dealing with hazards of inadequate wiring in the home, has won the 1953 Safety Film Contest's Award of Merit.



Hobbs Shepherd Dahlin Strong

BE HUMAN – IES IS TOLD

Pocket-size condensed conventions of the Illuminating Engineering Society began in the West with the first regional conference 10 years ago. Their success has increased and the two Western regions have held their seventh regional conference in April. The Pacific Northwest Regional Conference was at the Benson Hotel, Portland, April 2 and 3, under Walter J. Lind, regional vice - president, Vancouver, B. C. Walter E. Potter, General Electric Co. Lamp Division, was general chairman with Jerry Collins, Portland General Electric, as co-chairman; the Oregon Section, Ray W. Preston, chairman, acting as host. About 125 attended the conference.

The South Pacific Regional Technical Conference was held at Edison Auditorium, April 9 and 10, Los Angeles, under Regional Vice-president Leonard A. Hobbs, Smoot-Holman Co., with T. H. Shepherd, Los Angeles Department of Water & Power, as conference chairman and Oscar W. Meissner, same utility, vice-chairman. Southern California Section with Roy E. Dahlin, Southern California Edison Co., its chairman, was the host. Attendance at President Strong's dinner was 260; the conference attendance about 150.

President E. M. Strong, Illuminating Engineering Society, professor of electrical engineering at Cornell, was able to attend only the South Pacific conference. W. B. Gero, Westinghouse Lamp Division, Bloomfield; C. M. Cutler, application engineer, General Electric Co., Nela Park, Cleveland; Edward Rambusch, Rambusch Co., New York City, were three national speakers attending both conferences. Edward Karns, Westinghouse, Cleveland; Charles Rex, General Electric, West Lynn, Mass.; T. C. Sargent, Sylvania, Salem, Mass.; H. U. Hjermstad, Sola, Chicago, were additional national speakers at the Los Angeles conference.

Taking turns at presiding were the section and chapter chairmen: Paul Donnelly, British Columbia Section; Clarence A. Scheyer, Puget Sound Section; Kenneth Reid, Vancouver Island Chapter; and W. A. Newman, Inland Empire Chapter, Spokane. At the South Pacific conference Roy E. Dahlin, Southern California Section; Robert W. Thunen, Northern California Section; Dan Coyle, representing the Mother Lode Chapter, Sacramento; William Addison, San Jose Chapter, presided. Merle A. Potter was banquet chairman.

"My Most Interesting Lighting Job" contest winner in the Northwest conference was Don E. Frank, designer for Columbia Electric & Mfg. Co., Spokane, for the lighting of a banking room. Merrill Humber, Sunbeam Lighting Co., San Francisco, won the South Pacific contest with his description of the Broadway tunnel installation. See p 88. There follows a concise summary of the content of each of the presentations.

Light for Environment

One thing stood out in the Northwest conference held in Portland. This was the importance of taking into consideration all human senses and all of the factors that enter into vision in laying out lighting installations. Two speakers, Dr. Howard C. Hall, optometrist, Seattle, and C. M. Cutler approached the subject from different viewpoints.

Dr. Hall said that vision is more than sight alone—that there are many factors entering into vision, including other senses, touch, hearing, etc., and very definitely memory and the emotions. Sight is the forming of an image on the retina of the eye. Vision is the combining of the image with nerve impulses from other senses to create vision in the brain cells. Hence, he said, the illuminating engineer must go beyond the mechanics of providing foot-candles for seeing and create lighting for *vision*, taking into consideration all factors.

Cutler emphasized the importance of creating a selling environment with lighting and showed by a number of color slides how this had been done in a number of installations. He discussed in some detail all the long list of factors that must be taken into consideration before attempting to lay out a lighting job. He presented the same talk at Los Angeles and his check list will be published in a future issue.

In discussing ecclesiastical and institutional lighting Edward Rambusch was really talking about the practical application of all the principles laid down by Hall and Cutler. Rambusch showed by a number of slides how all conditions of lighting for vision had been met under difficult physical conditions in churches and institutional buildings. He, too, presented this at Los Angeles.

School Lighting Kit

A highlight of the Portland meeting was a presentation by Chester Jarrett, Portland General Electric Co., of a school lighting promotion that will be started this fall using a scale-model classroom with replaceable walls, floor, ceiling and miniature lighting fixtures to simulate the old and the new. The lesson of the demonstration was driven home by using a projection sight meter to show brightness readings from luminaires, walls, ceiling, floor and task. For this a little "Johnny" or tree arrangement holding six light

Potter Preston

Hall Shirley

Rambusch Thallon

cells was used. All the props, including a knockdown aluminum frame for the model room, will be transported around PGE territory by a small truck purchased for the purpose. Principal objective will be PTA groups so that they will back up school boards in getting money for classroom relighting.

On the subject of classroom lighting also Robert Thallon, Fluorescent Fixtures of California, gave results of a year's experience with daylighting of classrooms. Tests showed that for 34% of the time during the school year intensity was below 30 f-c and inadequate. Conclusion was that artificial illumination is necessary also to balance the lighting. Overcast days completely upset design engineers calculations on light distribution.

Jarrett

Lind Gero

Reis Henkel

Light Sources

Incandescent lamps set the pace for good lighting and it remained for fluorescent to raise intensity, said W. B. Gero. Expansion will be in diversification of both light sources for special uses, he feels. He said that the comparatively new mercury - fluorescent lamp, because of its white light, is ideal for replacing combination incandescent and mercury lighting with greatly decreased lamp replacement.

The mercury and fluorescent lamp offers the lowest cost white light for large areas, stated Gero. He showed and discussed the newest mercury lamp—a 35,000-lumen lamp of 700 w just being introduced. This fills the gap between the present 400-w and 1,000-w mercury lamps.

Lumber Inspection

A new long incandescent side lighting unit for use in grading lumber was described by A. F. Pongracz, Western Pine Assn., Downey, Calif. The unit is mounted just above board height and when used in a ratio of 10 to 1 in conjunction with existing overhead lighting creates an approximate balance in color. Better color rendition has resulted in less degrading of lumber, saving as much as the wages of the grader in one day, he said.

Efficiency is not the only criterion of design, feels Douglas C. Simpson, architect, Vancouver, B. C. At the same time he recognizes the production problem of the manufacturer. He thinks more consideration should be given to the architect's problem and that each job deserves its own analysis.

A rotation schedule has been set up for future Northwest IES conferences. Next year's meeting will be held in Seattle, either April 15-16 or 22-23.

Street Lighting Standards

W. B. Gero's talk on new street lighting mercury vapor lamps opened a morning session devoted to street and highway lighting. Then two different aspects of the newly revised standards for street and highway lighting under the "New American Practice for Street and Highway Lighting" soon to be issued were made by Edward Karns and Charles Rex. Much of this was carried in the August issue of *Illuminating Engineering*. Purpose of the standards is to provide traffic safety, curb crime and vagrancy, and promote civic progress. After dealing with tables of intensities and light distribution Karns illustrated situations requiring special consideration, such as intersections, junctions, alley lighting, curves, the tree problem, traffic circles, elevated and depressed roadways, freeways and expressways, railroad crossings, etc. Charles Rex covered more the light distribution aspects of the standards, stressing the tremendous investment in automotive equipment and business facilities for night business depending upon safe use of the streets and highways at night. He showed numerous slides of light-pattern distributions. In the question period following the talks considerable discussion ensued about the new 700-w mercury street lamps and whether ballasts and fixtures had yet been developed to go with them. Neither have been developed yet, Karns said.

Sources and Fixtures

Following a demonstration of both new incandescent and fluorescent lamps as well as a review of many of the standard ones with suggested new applications, given by C. M. Cutler, the evolution of ballasts for fluorescent lamps was described in considerable detail by H. U. Hjermstad. The latest were designed for the new 40-w instant-start fluorescent lamps whose cathodes are heated in series on the ballast and another 900-v ballast designed for fluorescent street lighting to operate lamps at 0° temperature. Another novelty was a new circuit and ballast arrangement for the dimming of fluorescent lights. Hjermstad was frank to admit the shortcoming of the

Addison

Meissner Humber

Delander Brown

Karns

Rex

Finch Thunen

Hjermstad

Sargent

previous circuits and ballasts. The originals gave starter trouble. The sequence system gave trouble and short life where lamps were switched on and off. His conclusion was that the whole system of rapid-start fluorescent lamps requires a more precise gadget than ever before made and a closer coordination of manufacturers of lamps and the makers of ballasts.

What is involved in the testing of fluorescent fixtures by a laboratory to obtain light distribution curves was well illustrated by Dan Finch, University of California, Berkeley. The large units create more problems of mounting and of obtaining proper test distances. He told of four schemes for test data calculation used at the university. Brightness, he said, is the most difficult to measure because there are many different systems that yield different results from the same fixture. Visual instruments are still better than photoelectric because the eye, after all, is the judge of brightness for humans.

To round out a session on light sources and fixtures, Ted Sargent gave a quick summary of the usual IES progress report. In this he covered all the new things in light sources, fixtures and applications during the past year.

"Is Lighting Still in the Dark?"

In a philosophic discussion, Prof. E. M. Strong, IES president, discussed illumination from the point of view of education and knowledge concerning it. He explored, as one would think aloud, answers to the questions—What do we know? What do we not know? How do we assess what we know about illuminating engineering? How well are we practicing all we do know? How well are we going out after knowledge—how about our research program? How well are we as a society dispelling ignorance? What are we doing in education? That lighting is for people and that more should be known about human reactions and psychology was a point that he kept stressing. He commended Dean Boelter of UCLA for including psychologists in the engineering department to increase the engineering students' appreciation of human values.

Lighting in Use

As an example of many kinds of commercial lighting in one building Paul Schmidt, General Electric Lamp Division, Oakland, discussed and illustrated the variety of lighting applications in the new offices and warehouse of the lamp division there. He was followed by Cutler, whose theme was the creation of a selling environment with lighting, giving a check list of factors involved.

School lighting in modern classrooms was covered by Dr. Leland H. Brown, Stanford University, who maintained that the technical specifications for standard practice in school classroom lighting were not practical for every-day use. He advocated rather practical working specifications as better suited to school people. Some of the new designs of schools to achieve daylighting, which bring the roofs down to correct for sky brightness, obtain brightness control at the expense of visibility of the task, he said. There is a great advantage to artificial lighting in that it can be controlled, that higher levels of lighting are possible on the seeing task and that brightness ratios can be kept in better relation. He advocated that each member could well take a school as a project and check it under various lighting conditions, to obtain data on light behavior under all weather conditions, and that these measurements should be forwarded to the IES for analysis and use.

Industrial lighting, said R. J. Delander, Sylvania Electric Products, influences the lighting of all other phases of light. Where an industrial worker operates under good lighting conditions he demands the same seeing ability at home and in the store where he purchases. The American Standard Practices for lighting prepared by the IES, he said, can be applied to practically all industries for improvement in efficiency and reduction of accidents. With slides, he illustrated a number of different applications, maintaining that no one light source is a cure-all and combinations of them for particular tasks must be made.

Five different points of view were

expressed regarding the necessary coordination of architect, engineer, contractor, manufacturer of fixtures and utility to obtain better lighting, at the afternoon session Friday. Oscar Meissner acted as moderator.

Arthur B. Gallion, dean, USC school of architecture, emphasized the need to show the public that professional talent is necessary for the design and coordination of the various elements of a seeing environment. Foster K. Sampson, electrical engineer, traced a design from architect through to completion, showing the many different people to be satisfied from owner to various utilities, contractors, structural requirements and finally the price itself.

Lou Barth, Barth-Morrow Co., electrical contractors, let down his hair as to contractors' problems in competition to do a job at a low price. He admitted contractors do not know enough about the new things coming out in lighting. He commended the utilities for helping contractors so materially with facts and figures.

Carl Martin, Benjamin Electric Mfg. Co., maintained it was not so much a question of problems as of responsibilities, which have been neglected. He gave examples of a contractor who had worked hard to sell a lighting job but had not figured the voltage drop and put in enough copper. A manufacturer has a responsibility, he said, to guide in the selection and the installation of his product as well as keeping the contractor and engineer informed of the constant changes in lighting materials and methods. There is no longer any excuse for the use of substitute materials, he said, or making compromise on quality.

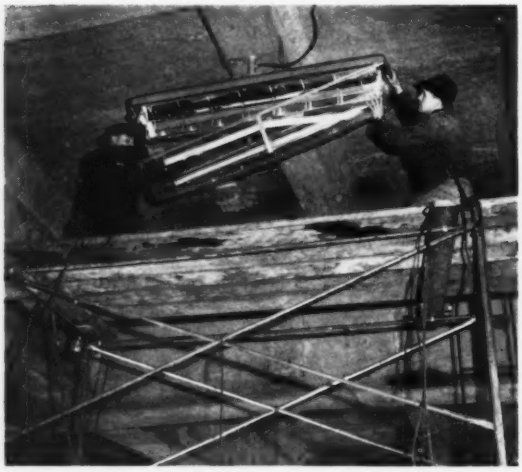
O. K. Buck, Los Angeles Department of Water & Power, said the missing person, the owner, should be included in the panel. He is responsible for many of the difficulties but after all he pays for his mistakes. The utility, however, has to live with the job from then on and finds that a job is only as good as those who have worked on it. He particularly emphasized the need to plan more for future additions and increases, especially in providing circuit capacity and a design with basic flexibility. He advocated that the architect get his mechanical and electrical engineers first to design the mechanical system of a building and then wrap his building around it, for it is the end use of the building that is important, not its appearance. A question period was devoted chiefly to discussion of where a job requires a professional engineer and where the planning service of a utility or manuturer is sufficient.

Residential Lighting

Good-natured fun was poked at the decadent condition of the residential fixture business by A. O. Grotenhuis, Moe Lighting Co., Los Angeles, assisted by Nat Blumberg and Jerry Long. They kidded the builder and contractor who turns down one lighting fixture after another, finally ending up with a single circuit. Twenty years ago lighting fixtures for a home represented from $100 to $200, whereas today in the tract houses from $10 to $20. Yet garbage disposers are installed in each. He ended up by showing some of the possibilities for obtaining more illumination by the use of valance units. The opportunity for relighting was expressed in a chart that showed that more than 46% of all the houses are over 30 years old and the fixtures similarly dated.

Next regional conference of the South Pacific Region will probably be held in the San Francisco Bay region in 1954, at approximately the same time in April.

Conference Chairman Shepherd was presented a certificate of merit by Roy E. Dahlin, Southern California Section chairman, for his outstanding efforts above the line of duty in handling all the details for the regional conference.

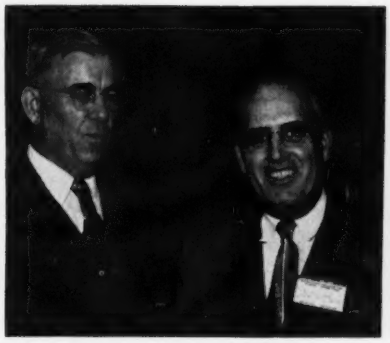


Workmen install one of the 77 center-mounted fluorescent units for center level of viaduct, where mounting height was restricted

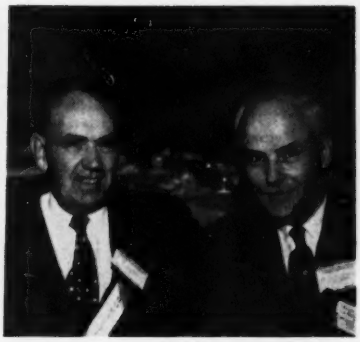
Seattle Tries Fluorescents

One of the first applications of fluorescent lamps to street lighting is being installed in Seattle on the middle level of a three-level Alaska Way Viaduct. The top and bottom levels of the new overpass will be lighted by the conventional mercury-vapor lamps which have become the standard for major traffic arteries in Seattle's street lighting program. The center level, with a restricted mounting height of only 18½ ft, is too confined for the strong light sources. Instead 77 center-mounted General Electric fluorescent street luminaires are attached to the underside of the top level as shown above at left. Spacing is at 60-ft intervals along the 40-ft-wide, mile-long roadway, giving an average 2.5 f-c of constant light intensity. Wide distribution of brightness of the light source and a maximum candlepower angle of 70° make this kind of lighting especially suitable for the restricted mounting height in such an application.

Dierdorff Warren



Purton Sawyer



Duffy Steede

Hard-Hitting Engineers Attack Problems

A symposium on the use of aluminum conductors, several question-and-answer periods and a report of the house heating committee highlighted the annual meeting of the Engineering and Operation Section, Northwest Electric Light & Power Assn., held in Portland April 8-10. A registration of 352 set an all-time record. It was a hard-working session under the whip of Section Chairman T. A. Purton. Call to order was at 8 a.m. on two of the three days with about 150 in attendance at that early hour.

Mayor Peterson welcomed the group to Portland where, he said, "we believe in private enterprise." Frank Warren Jr., vice-president, Portland General Electric Co., said that cost is the problem that faces engineers and has placed upon them the responsibility of mechanizing and finding new methods to effect economies.

Association President John Dierdorff, vice-president, Pacific Power & Light Co., said: "Today it is not enough to be a technical engineer. One must be an economic engineer as well." He thinks private utilities in the Northwest will have to spend more on power development in the future than in the past to take up some of the load that has been carried by government heretofore. "We will have to become more self-sufficient, probably on a joint basis," he said.

"Action on three matters will serve as guide posts and determine future federal power policy," said E. Robert de Luccia, vice-president, Pacific Power & Light Co., speaking before a luncheon meeting. The three are Roanoke, Clark Hill and BPA steam plants. He discussed federal power policies in some detail, to show that Interior policies were not designed to permit the economic existence of private utilities. De Luccia feels that the present administration has the opportunity to clarify power policies and enact legislation to correct past practices.

Conductor Materials

With controls lifted copper should follow the law of supply and demand, said C. D. Dimity, Phelps-Dodge Copper Products Corp., and it is only a matter of time before supply will equal demand. Government interference largely created the copper shortage, he declared. Scrap should become unfrozen and foreign supplies will increase now that controls are off, Dimity said, and the outlook for increased copper supply is more encouraging.

Aluminum, iron and magnesium are the metals of the future, based on abundance curves, said E. W. Greenfield, Kaiser Aluminum Co., Spokane. Because of lower price, less tonnage required and greater availability, he looks for rapid expansion in the use of aluminum in the conductor field. He said aluminized hardware and core wire, anodized magnet wire and aluminum sheath cable are definitely in the picture.

E. A. Casey, Anaconda Wire & Cable Co., thinks use of copper in the future will be confined largely to small building wire sizes, where it is preferable. He thinks too that aluminum will displace copper for underground cables. "We will never be as prolific in the use of copper as in the past," he said, "and copper will be reserved for its indispensable uses, which as we see it today is 114 lb per kwh."

Questions and answers on the use of aluminum occupied half of one session and brought out detailed and specific information on uses and practices. Much of the discussion concerned spun aluminum secondary cable and triplex services, vibration, armor rodding fittings and synthetic insulations. Casey said an aluminum conductor with 2/64th in. of a rubber-like insulation and 2/64th neoprene overcomes the disadvantages of all polyethylene or all neoprene.

House Heating

For the report of the house heating committee under chairmanship of R. E. Sinclair, Pacific Power & Light Co., the entire time was given over to W. F. Friend, Ebasco Services Inc., New York. He gave a comprehensive review of the whole subject, stating that engineers were disturbed on how to handle size of the load and the very low diversity on cold days. Friend feels that load-limiting devices hold forth greatest promise of controlling peaks and creating better diversity. "There is strong evidence that the present characteristics of house heating do not compare with other loads," he said. Much research is going on in thermal storage and some chemical like disodium phosphate may be the answer in this field, he thinks. Friend threw a bombshell when he predicted that window-type air conditioner units, with heat pumps, would bring a domestic load to pale present usage. He said there were 61 manufacturers going into this field. In 1952, 412,000 units were produced and this year 1,000,000 units will be built.

Electronics

Brand new audio tone supervisory control equipment was demonstrated

Ashworth Shevalier

Sinclair Stinson

Arnett Hatch

at the electronics session by Leonard Walker, Motorola, Chicago. He said improved techniques, minimizing, use of transistors, new materials and plated circuitry were the things to watch in electronics. But A. A. Noon, Puget Sound Power & Light Co., reported that there is no trouble so far from harmonics from the Navy's Jim Creek 1,000-kw station north of Seattle. It looks as though power companies will be able to continue to use power line carrier above 30 kc.

For microwave of six channels or less, it would pay to lease facilities, stated Ralph Deesen, California-Pacific Utilities Co. J. R. Downing, PGE, discussed community television, stating installation of co-ax costs about $3,000 per mile and that a fair rental charge for contacting utility poles is a rental of $3 per pole per year. CTV costs the customer about $175 for installation and $3.75 a month. He thinks it is good business for the utility to cooperate in the use of poles for CTV because television adds 15 kwh per month consumption and besides there is a public relations angle.

TV Interference

Only about 10% of television interference is caused by power lines, stated Noon, in reporting on television interference in Puget territory. Out of 660 complaints only 74 involved power lines. Of these, 34 were cases of poor bonding. Reporting on microwave reliability, L. A. Carter, Pacific Power & Light Co., said that only minor troubles had been experienced on the 13-mile Merwin-Yale plant supervisory control link. Reliability has been 98.7% during the first six months. Of outage time, 50% was from tubes and 33% from components. Carter reported that on the Bonneville system most trouble came from germanium crystals overheated from soldering. Only one case of fading has been experienced. The electronics committee is headed by W. H. Blankmeyer, communication engineer, Montana Power.

Electrical Equipment

Supervisory control practice of Idaho Power was discussed by D. R. Russell of that company. He said the company has 22% of distribution and 45% of transmission breakers under supervisory control. He would like to see the manufacturers bring out a building-block type of supervisory for five- to ten-point control. G. L. Lane, Washington Water Power Co., talked on load interrupter devices. They fill the gap between disconnects and oil circuit breakers, he said. Gus Schwager, Schwager-Wood Corp., told of a new 7.5/15-kv load break switch his company was offering to supplement its line of 69-110-kv interrupter switches. A Westinghouse representative described a 600-amp, 115-kv interrupter switch using sulphur hexafluoride to cool the arc, which his company is offering. It expects to extend voltage range to 230 kv and possibly 330 kv, he said.

Leading a discussion on load ratio control Sid Caldwell, Portland General Electric Co., and other speakers reported highly satisfactory experience and low maintenance on tap-changing-under-load devices. Utah Power & Light and Schoville, PGE, reported 210,000 and 120,000 operations, respectively, without serious contact trouble. Al Pride, Westinghouse, answered the question of whether the life of TCUL equipment shouldn't be built to match the long life of transformers by saying that the manufacturer will produce such a tap changer, if wanted. It is simply a matter of economics, he said.

Utilization Committee

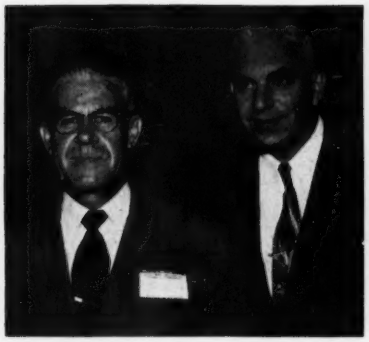
A lively question-and-answer discussion was moderated by J. H. Steede, B. C. Electric Co., on subjects ranging from the use of 277/480 v for commercial loads to television, series street lighting, sprinkler irrigation and duplicate service, to motor-starting currents. The nonstandard transformer required for the 277/480-v system was mentioned. Manufacturers reported that such transformers would become standard if use of the system becomes widespread. There was considerable discussion of the Henry phase converter by which three-phase motors may be operated off single-phase rural lines. It was brought out that the device has advantages but that it must be derated when applied to irrigation pump motors. Westinghouse reported that its new CAP-2, single-phase motor will do the same thing as the Henry phase converter with none of the disadvantages. It was stated that manufacturers should build three-element protective devices to protect three-phase motors from single phasing and burn out. Manufacturers' representatives rose almost in a group to say that such a device is made by Cutler-Hammer, G-E, Westinghouse and Allis-Chalmers.

A new static-type 25-lamp, 10-kv, 2,400-v/3.2-amp regulator for series street lights was reported. A time-delay relay is used to eliminate individual lamp ballasts at a saving of 10% in losses. Mounting height in connection with high-lumen mercury street lights was mentioned as a problem. Regarding duplicate service with throwover, it was reported by several utilities that such service is provided in very special cases only.

T & D Committee

Two interesting motion pictures were shown, one on the Waleach hydro development of B. C. Electric and the other above- and below-ground line treatment to extend the life of standing poles by Dan Kamphausen. Preservation of poles and timbers was covered by Lyle Salquist, Chapman Chemical Co., and Jim Ziegler, McCormick & Baxter Creosoting Co. Lester Gamble, Washington Water Power, reported discovery of a large wood-bor-

Blankmeyer Deesen



Eden Miksch

Donnelly Hempel

ing "animal" that was raising havoc with its cedar poles, although the insect was supposed to feed only on ponderosa pine. Penta will not kill the borer but a chemical has been found that will, and he expects to have the situation under control. He cited this to point up the fact that it pays to full-length treat new poles and apply inspection and treatment to standing poles.

Power Production

The 1952-53 operation of the Northwest Power Pool during the critical power shortage of the past winter was discussed by M. F. Hatch, Washington Water Power. He said 200 mw was about the limit of curtailment, aside from interruptible. He said that the next few years will be nip and tuck under adverse water conditions. Interruptible of about 400 mw will be forced off every fall. He expects more generation by local agencies to help relieve the situation.

D. G. Van Ornum, North American Weather Consultants, firmly believes in the efficacy of cloud seeding. He said that in six cases the increase in precipitation was 19%. Hope was expressed by him for long range weather forecasting using a coordinate date system he and his associates have developed. He expects good accuracy up to six months in the future from the system.

Operating gains through automatization of hydro plants was pointed out by P. G. Humphreys, California Oregon Power Co. He cited its eight Umpqua River plants with capacity of 210,000 kw as examples of what could be done in the way of operating economies. Automatic control will reduce operating cost 25% over a manual plant, he said. This point was further emphasized by someone from Portland General Electric Co., who said that rebuilding and automatizing its old Station B hydro plant at Oregon City would reduce operating labor from 23 to 2 men.

J. E. Barkle, Westinghouse, East Pittsburgh, described the induction generators at the Oregon City plant, pointing out the good possibility of the governorless induction generator finding a wide field use in developing some of the smaller, and now considered uneconomical, hydro sites. He said that over-all cost reduction, simplicity of construction, reduced breaker duty, run-of-stream operation, ease of applying automatic controls and relatively good efficiency offer a promising future for the new design of the old induction generator.

On Saturday delegates were offered interesting inspection trips to the new Yale plant of Pacific Power & Light Co. and modernized Station B of the Portland General Electric Co. at Oregon City.

Electric Clubs

Los Angeles Electric Club and San Francisco Electric Club heard Charles A. Scarlott, manager of technical information, Westinghouse Electric Corp., Pittsburgh, on April 13 and 20, respectively.

San Diego Electric Club heard Jim Bowen give a description along with a color movie entitled *Dust Splicing of Paper Insulated Lead Covered Cable,* filmed by Les Kobler, San Diego Gas & Electric Co., at the last meeting in March.

NCEB

W. J. Lee, Sherman-Clay Co., was re-elected president; Charles W. Goodwin, G-E Supply Corp., vice-president; O. R. Doerr, PG and E, secretary; Frank K. Runyan, Western Merchandise Mart, treasurer; J. S. C. Ross, PG and E, chairman of the executive committee; and LeRoy H. Bennett, manager, of the Northern California Electrical Bureau at its annual election of officers. Basic and promotional budgets were approved. For 1953 the program contemplates kitchen and laundry promotions, rural shows, cooking schools, electrical housewares promotions, television, lighting and wiring activities, model homes, Christmas lighting and rural sales training. New bureau units were organized in Santa Maria and San Luis Obispo and an Oroville group has applied for membership, making a total of 20 units in the area.

NAED

Following the 45th annual convention of National Association of Electrical Distributors at Chicago, May 24-29, the Pacific Zone convention will be held at Huntington Hotel, Pasadena, June 8-10, with Sam W. Scott, zone chairman, presiding. A program for the general meetings is being arranged, timed to some of the problems of distributors in a changing economy.

Dealers

Appliance & Radio Dealers Assn. of Hawaii elected I. C. Jepson, Electrical Distributors Ltd., as president succeeding Virgil Nahl. Richard Yamaoka, Electrical Equipment Co., is vice-president; Francis Williams, Hawaiian Electric Co., secretary; Herbert Inouye, Radio Appliance Co., treasurer; and Thomas R. Shields, executive secretary.

Billings, Mont., Appliance & Radio Dealers Assn. has joined NARDA. Officers are J. R. Westwood, president, E. F. Carlson, vice-president, Mrs. B. T. Bergeson, secretary, and W. B. Spencer, treasurer.

NISA

William M. Hogue, Larsen-Hogue Electric Co., Los Angeles, a vice-president of National Industrial Service Assn., and a number of Western motor shop proprietors are planning to attend the NISA 20th anniversary convention at Hotel Statler, New York, May 24-28.

Olpin Liecty Coughlan

Sargent Moulton Smalley

Job Know-How, Human Relations on Phoenix Program

A program that gave ample opportunity for an exchange of ideas on the mechanics of the job but did not neglect the human side of the public utility business brought another vote of confidence in joint meetings from members of Pacific Coast Electrical Assn.'s Administrative Services Section and the Pacific Coast Gas Assn.'s Accounting Section who attended sessions at Jokake Inn, Phoenix, April 8 and 9. Although strikes kept all Southern California Edison Co. men at home and reduced attendance by Southern California Gas Co., 122 were registered, including representatives of 12 utilities, three utility districts and seven manufacturers and distributors.

Group discussion was confined to four sections—automotive transportation, materials handling, personnel development, forms design and office equipment. The other four—customer activities, building design and maintenance, right-of-way and land, plant accounting — met at Fresno last November.

Like the Fresno meeting, that at Phoenix was planned by H. L. Moore, Southern California Edison Co., and L. C. Olpin, Mountain Fuel Supply Co., co-chairmen, and George Coughlan Jr., vice-chairman. Coughlan pinch hit at Phoenix for Moore. J. E. Kern, assistant manager, PCGA, in cooperation with the Arizona Public Service Co., made the arrangements at the inn. Henry B. Sargent, president, and John L. Liecty, treasurer, Arizona Public Service, were Phoenix hosts.

The utility industry has a great story to tell but the telling is up to the people in it, individually and as groups. That is the opinion of D. D. Smalley, PG and E vice-president and president of the PCEA, whose luncheon topic was "We must Tell as Well as Sell."

Explaining how an engineer and operating man came to choose such a subject, he told of his sudden discovery that his 18-year-old son, a college student, was sold on the idea that the power company was a monopoly and as such something to attack and detest.

His own unprepared definition of monopoly probably would have been "a business that has no competition," Smalley said, then asked if anyone in the room believed that the electric utility today has no competition. In addition to its honest, straightforward competitors, for 20 years it has had government competition. It is also in competition with the household budget and can only build load in the average household at the expense of every other business that has something to sell, he declared.

Even agreeing that gas and electric companies are monopolies, he asked which should be chosen, controlled monopolies or uncontrolled competition—competition that pays no share of the taxes, so arrogant that it is above participation in the problems of community life and yet bears down on the very business which, by its tax contribution, makes that uncontrolled competition possible.

Because the companies have done a swell job of selling, their business has grown in spite of bureaucratic competition, but serious inroads are being made that threaten their very existence if they do not tell their side of the story, he warned. "Free enterprise is never free. We have to work at it, live it, tell it and keep on telling it," he declared. "Nothing stays alive by itself and nothing can feed solely on past performance . . .

"Why not tell our industry story all day long to everyone you can reach and put in some overtime on it, too. Tell it the same way you sell, with confidence, with enthusiasm, with pride. Do it as individuals, do it as organizations; tell, sell and tell and your bonus will be beyond your fondest dreams for you and your children and your children's children."

Pointing out that the industry cannot risk the luxury of a feeling of security because of the election last fall, he stressed "the folly of being complacent when the enemies of our way of life and of doing business are constantly working against us."

That a business must sell its products or services to stay in business is a well-recognized axiom, he said. "It is also axiomatic that we must tell about our business too." If the public knows the industry's great story, its enemies will not find it easy to win support for their criticisms, he believes.

In conclusion, he pointed out that the industry's problem is really no different from the nation's today. "We have to sell freedom and democracy to the world and the best way of do-

Brass Hawkesworth

Middleton McNab

ing it is to tell the great American story. Tell the story of Horatio Alger and impress it on the minds of our youth; tell the Horatio Alger story to the other countries of the world; never stop telling it."

Our Business Is With People

As utilities become larger, more and more employees are removed from daily business contacts with customers and the public and should remind themselves frequently that their business is with people and that the object of every action should be the maintenance and improvement of good public service, J. S. Moulton, vice-president of PG and E and PCGA president, declared in his Thursday luncheon talk.

Pointing out that the industry deals with people from all walks of life, he said its public includes: (1) customers, (2) investors, (3) suppliers, (4) regulatory officials, (5) public administrators, (6) employees. "Our success individually or as corporate entities, or as a great utility industry, depends upon worthiness in the test of human relations," he declared. "There is no natural conflict between the reasonable aspirations of any two or all these groups of people."

All the industry's abilities, engineering and technological know-how, foresight, its internal organization and experience could be wasted if its customers are not convinced that they are getting good service and that their rates are reasonable, he pointed out. "We must not only give the customer good service, we must remind him as well as all of the other people with whom we do business, and perhaps prove to them from time to time, that they are well off utilitywise. If we do not, they will take us for granted and never know the great dramatic story of people and service behind the blue flame and the electric switch. Nobody else is going to tell our story for us."

The industry has the tools to tell its story, he pointed out, and they include every means of communication from TV and other direct-approach advertising to telephone manners and the personality of servicemen and counter clerks. Time was, he said, when these tools were not well sharpened, when it was thought that good service measured by technical standards was sufficient. Now all that is changed, he brought out, and policy is to publicize the stories behind service interruptions, threatened shortages, rate increases; to tell what the company is doing to minimize customer inconvenience, what its construction program is, and how rates compare with those in other parts of the country.

These tools, taken alone, are not enough, he emphasized. "One of our most effective tools is a body of well-trained, well-informed and courteous employees. In convincing the 'back of the scenes' employee that his is an important job that goes beyond what he or she does sitting at a desk, we must first prove to him that he should know and talk about his company. Then we must get the facts to him."

The long-run future of the utility industry will be determined by the success with which it carries on its relations with people, he concluded. "Our business, after all, is *public* service. If we look at it in this light, the public utility business will never be dull for our business is with people."

Automotive Transportation

W. H. Brown, So. Calif. Edison
Sponsor

R. M. Middleton, San Diego Gas & Electric
Presiding

In the absence of W. H. Brown, R. M. Middleton took charge of the round-table discussion. Members were unanimous in asking for continued joint meetings of the section.

Truck Body Design

K. B. Anderson, Coast Counties Gas & Electric, presented slides of a recently designed gas service body that features an air compressor and arc welder mounted on the body, and an air-operated winch mounted on the front of the six-man cab truck chassis. This vehicle loaded with material and equipment has a gross vehicle weight of 16,000 lb.

Slides showing various specialized bodies designed for field meter and customer service work were exhibited by utility representatives and manufacturers' representatives displayed slides of many standard body designs with optional revisions and additions that make them adaptable for use under a number of operating conditions.

C. R. Stanley, PG and E, presented slides of a newly developed electric line body, explaining that the mechanization of electrical construction crews had necessitated considerable revision in body design to provide for storage of portable generators and powered tool equipment. Of particular interest was the use of a hydraulically operated pole derrick that is hinge mounted at the top of the body in such a manner that it rests atop the body structure when in the carrying position.

Location and mounting of radio equipment on all types of vehicles were considered in an open discussion.

In summarizing, it was generally concluded that, because of the many variable operating conditions and specialized functions of the individual utilities, standardization of truck body design would be impractical at present.

Maintenance, Inspection and Servicing of Powered Equipment

Various types of earth-boring equipment were discussed. Lack of readily available repair parts for one machine appeared to be a serious maintenance problem among companies represented, with some reporting a two-month delay in delivery. One representative reported a preference for chain-operated elevating mechanism over the gear type on earth augers.

A-frame-type hole diggers were discussed and operation pictures were shown, with the group agreeing that the units would be quite satisfactory under certain operating conditions. Turn-table-mounted earth boring machines were reported not in general use at the present time.

Increased traction was claimed for

one manufacturer's truck models featuring the use of torque proportioning differentials.

No maintenance problems have been encountered in the use of rotary-type air compressors, it was brought out. Chief advantage of this type of machine was given as smaller size and weight ratio as compared to output capacity. The opinion was expressed that the weight differential between the rotary- and reciprocating-type machines could be offset by equipping a reciprocating compressor with positive acting valves and operating the machine at higher constant speeds.

A quick method of checking compressor output through use of fixed orifices and the resistance of hose couplings was discussed and the possibility of reclaiming the large amount of oil drained from rotary compressors at oil-change periods was considered worthy of investigation.

Use of Automotive-Powered Equipment

A motion picture was presented by the representative of one auto body company, showing workmen using truck-mounted revolving ladders, pole erecting derricks and A-frame-type pole hole diggers.

Discussion indicated that the most generally used insulator washing machine is the hydaulic ram-type tower, the slow lowering speed of these units being considered their only serious fault.

One type of machine was recommended by the group for tree trimming operations and another for street light maintenance.

The use of fork lifts for yard material handling continues on the uptrend. High maneuverability and the availability of many types of fork lifts for special functions make this a popular unit, it was brought out.

Skip loaders of various types are finding new uses in utility operation, it was declared. One company reported using a detachable rooter attachment on the bucket for removing broken asphalt and concrete paving from atop trench excavations.

Both the pneumatic actuated and the drop hammer-type pavement breaker and backfill tamper are in use by the member companies. The self-contained drop hammer type is considered the more satisfactory on a work unit cost basis.

Passenger Vehicle Replacement

A number of methods for computing the most economical time for replacement of passenger vehicles were outlined. One company with an exceptionally high mileage operation follows a definite age replacement program. Other combination age-mileage and point systems were discussed. All these systems rely on the judgment of qualified personnel to estimate and determine the most economical time for replacement of individual units.

Materials Handling

E. F. Hawkesworth, So. Calif. Edison
Sponsor

Stores departments of the majority of companies represented organize and administer materials control, using card systems or IBM records. Stock levels are maintained by reordering material at predetermined ordering points, using bin cards or repeating requisitions. In a few cases future material requirements are given to the stores department by engineering so that abnormal needs will not upset the normal procurement pattern. It was the consensus that control of materials should be reviewed constantly so that inventories are adequate but not out of line.

Pipe Processing and Handling

Some of the companies receive pipe at wrapping contractors' yards, where it is inspected and tallied by a company employee. Others receive and process pipe in their own yards. Coal tar and air-blown asphalt are used as dictated by the individual company policy. Rag felt, asbestos felt and Fiberglas products are used generally. The majority employs a sacrificial outer wrap of kraft paper. Trend in pipe hauling is to large semis, rather than trucks and trailers.

Standard Packaging

To simplify the job of receiving, warehousing, inventorying and issuing, most utilities request and receive both electric and gas fittings in standard packages where available. Some do not request standard packages and are still receiving items in bulk, which increases handling costs. Considerable progress has been made with vendors in extending the scope of standard packaging but further advance is needed and more requests should be made by individual companies, it was concluded.

Mechanical Methods of Material Handling

To curb rising labor costs and take advantage of "air rights," mechanical methods for material handling are used generally. Fork-lift trucks and mobile traveling cranes are being used extensively. Wood and steel pallets, cargotainers, palletainers and pallet racks are the most popular items for storing and handling bulk materials, it was brought out. However, it is believed that there is a great deal of work to be done by the companies in this type of mechanization.

Purchasing Practices

All utilities are paying closer attention to purchasing techniques involving conditions and terms of the order, FOB points, methods of analyzing quotations and buyer training programs. Value analysis is receiving greater attention from all companies, it was pointed out, and the majority at the meeting buy M&S supplies centrally and distribute them to division warehouses. A number purchase locally for public relations benefits, and local or district purchasing is closely controlled by all. Salvage is generally shipped to a central point and sold by bid through the purchasing departments.

Personnel Development

James T. McNab, Arizona PS
Sponsor

Workshop sessions on training, orientation and work standards of office employees consisted of introductory talks on various aspects followed by lively discussion periods in which all 45 delegates participated.

William Ismay, Arizona Public Service Co., described the attributes of good leadership, pointing out that supervisors should be leaders, not "bosses." He defined the cardinal qualifications for leadership: intelligence, integrity, forcefulness, fairness, loyalty, emotional stability, sense of humor and knowledge of work.

The discussion period brought out the necessity for building sound supervisory attitudes toward employees, the company, stockholders and the public.

Finally, attitudes toward employees particularly were analyzed. These attitudes, it was stated, are demonstrated in the supervisor's knowledge of the job, ability and capacity for taking action.

What Is Employee Education?

R. E. Parsley, San Diego Gas & Electric Co., defined the meaning of employee education. He analyzed voluntary and involuntary programs, pointing out that both types of training were directed at one or more of these goals: orienting the employee; training him in management skills; training him in human relations skills; training him in technical skills.

Benefits of the training are many, he stated, and include cutting waste,

diminishing absenteeism and turnover, lessening grievances, generally improving job satisfaction and morale.

Consensus, following discussion of current practices, was that more thorough accounting training programs should be developed.

Why Train Accounting Employees?

H. B. Everett, Southern Counties Gas Co., could not attend and his paper was read by C. T. Dickson, Arizona Public Service.

Everett stressed that training programs for accounting employees are constructive because (1) they are getting training, whether it is formalized or not, and formal programs can insure *good* training; (2) well-trained accounting employees can cut waste for the company if they understand aims and accomplishments.

Evaluation of training programs, it was stated, should include careful consideration of the supervisors' opinions; promotion of the program, which directly affects its success; retention of training by the employee when he is on the job; and problems or mistakes attributable to the lack of training or improper training.

Aims of Education Programs

J. Q. Abel, Southern California Edison Co., said the goal of the education program is to help the employee be of maximum value to the accounting department, the company and himself.

To accomplish that goal four aims were established: to orient the employee; to instruct him in his job; to mold and help him adjust to company thinking; and to stimulate him to more knowledge and higher accomplishments. Each was discussed in detail and the company's "Welcome" booklet was used to show one way to give background information.

Types of Programs

Keith Turley, Arizona Public Service, covered specific methods of training employees. He pointed out that training media are adjusted to fit the needs of three groups—the new employee, nonsupervisory employee and supervisory employee.

The types of training—meetings, publications, films, etc. — for each group were covered. But it was stated that, in the last analysis, good supervision is the key to training and the training program; without supervisory cooperation and enthusiasm no program can succeed. That conclusion, the speaker said, underlines the need for adequate training of supervisors, so they in turn can contribute to the success of programs for all employees.

Sources of Help

C. A. Wilcox, Pacific Gas and Electric Co., outlined the organization and functions of his company's employee association, which operates a vast educational program.

Points of interest brought out were: (1) That the program is almost exclusively operated by employees who serve on numerous committees; (2) participation is entirely voluntary but has run as high as one-third of all employees during a year; (3) during 1952 there was a total of 440 courses; and (4) competition between sections has increased interest.

Also discussed were the relative advantages and disadvantages of employee-operated and management-operated programs.

Benefits of the company's present program, the speaker said, include improvement in morale, uncovering of latent administrative ability and availability at all times of a wide selection of self-improvement courses.

Survey of Program Types

E. A. Clark, Coast Counties Gas & Electric Co., discussed the results of his survey of the training programs for office employees of 14 member companies.

Most notable of his findings was the lack of formalized training programs, he said. While most companies use informal methods of training, it was felt that specific training is just beginning in the accounting field and that much work needs to be done on organization and methods.

In contrast, a majority of the companies have programs for employees at the supervisory level and above, though it was pointed out that in one field—formal training for executive positions—there is again a lack of activity.

Manpower Standards

P. T. Scollard, Southern California Gas Co., presented a descriptive application of manpower standards, as applied to the mail payment processing group of personnel.

In developing such a program it was essential for the supervisor to assist with the development, to better understand the mechanics, to evaluate answers and determine results.

Charts were used to describe the mechanics and results of manpower standards covering a period of several years. Through use of this tool, the supervisor developed a trend of production and a yardstick for new employees.

Considerable saving in operating expense has resulted from use of standards established, it was brought out.

Forms Design, Office Equipment

John Brass Jr., PG and E
Sponsor

An exhibit of forms drew a good deal of attention both from those interested in their design and those interested in their use. Cost of preparation will usually amount to 10 to 20 times that of printing the form, it was pointed out in discussion, and use of the form may frequently cost from 50 to more than 100 times its preparation. Therefore, before adoption of any form, it should be established definitely that its use will save enough time to justify its design, printing, stocking, handling and filing, it was emphasized.

As soon as a form has served its purpose, it should be eliminated, it was urged. A filing system showing tie-in to various procedures; title and number for identification; indication of latest printing were among control devices suggested.

While variations were noted, it was generally agreed that the original design should be prepared by a person thoroughly familiar with the procedure covered and should be checked with all departments concerned; that the purchasing department should be consulted for standards and prices. The forms designer, who makes the final draft, is usually a member of the methods and procedure group or head of the print shop. One of his most important qualifications is willingness to accept suggestions and criticisms, it was pointed out; others are knowledge of methods and procedures, office machines, types of paper and printing processes.

Factors governing size of order are usage, delivery time, available storage space, quantity prices. Three to six months' supply seemed to be general practice for easy-to-get forms.

Snapout carbon forms are being used generally by the companies because they save time, give good copies and often cost no more than the forms plus separate carbon paper. It was suggested, however, that use should be determined by separate analysis of each form.

Final advice on forms: when convinced it is necessary and designed to give desired end results, hold it for a 7- to 10-day "cooling-off" period.

Rate Charts

Lawton C. Hughes, PG and E, described a procedure that he has de-

veloped for computing and preparing rate charts with tabulating equipment. He said that this has reduced the number of operations to the point that the job requires only a few employees for a few weeks, as compared with a large staff and a few months with the previous system of computing on calculating machines and typewriting.

Office Equipment

Standardization — Most companies buy the type of equipment for which service is available in the area in which it will be used; seldom confine purchase to one make.

Maintenance — Some companies have their own office equipment repairman but the majority use distributor's service agreements.

Replacement — Schedules are not common. Generally replacement is considered when maintenance costs begin to mount.

Office furniture — There is a trend toward standardization on metal furniture for public offices.

Ten-key vs bank-type adding machines—Opinions differed widely. All companies appeared to be using both types, while departments within the companies standardized on one or the other. One manufacturer had conducted tests to prove that speed may be had on either type, depending on the nature of the work. Elimination of the motor bar on the new key-activated machine eliminates one motion, it was pointed out.

Electric typewriters—Generally accepted for heavy-duty jobs and where even touch is important and in some cases for long carriage work. No company present uses them to the exclusion of manual machines.

Centralization of duplication equipment — This varies with companies but as a rule centralization makes for better trained operators who can produce better copy, it was brought out. Preparation of masters in a central bureau was believed to insure better reproduction work; typing by the individual department, better composition.

Check signing machines—These are used by the majority but in varying degrees. No company represented uses them outside the head office and use is generally limited to pay roll and dividend checks. Control is by locks.

Bill receipting devices—Companies represented use everything from flexible-handle rubber stamps to perforating machines. None uses cash registers. Several use a machine for receipting mail collection stubs; some have discontinued receipting these stubs and no longer put the route and account number on checks, which are treated as cash.

Desk counters—Two companies reported one-third improvement in efficiency after installation in district and local offices. Another company uses a work desk extended back from the counter at same height and provides a swivel posture chair so that the clerk can wait on customers by making a quarter turn. One company using contact desks reported that seated customers are likely to take more time than customers who are standing at a counter.

Electronic computers — Consensus was that these machines are promising but as yet capacity for normal business functions is limited by the mechanical input and output equipment. Machines using punch card input and output have proved very satisfactory, it was reported.

Photo copying — One company recently purchased a portable machine for copying records in connection with right-of-way and land problems. This machine, which is like a small suitcase, gives an exact photograph of the records and eliminates any extra calls to check accuracy.

Tabulating vs key-driven equipment — Discussion brought out experience with various machines but did not result in definite conclusions. It was believed generally that any of the production jobs could be performed successfully on either type.

Other PCEA Activities Reported

At the April 18 meeting of the PCEA Board of Directors, President Smalley announced the appointment of L. M. Guibara, U. S. Rubber Co., as PCEA representative on the industrial safety advisory committee. This committee was set up by the State Division of Industrial Safety to consider revision of the state's Electrical Orders. A. C. Blackman, chief of the State Division of Industrial Safety, has said that the revision of Electrical Safety Orders will be the subject at a public hearing this fall.

The report from the membership committee listed 241 Class A (company) membership renewals, 45 new Class A memberships, and an increase of 404 Class B (personal) memberships. At present PCEA has a total of 286 Class A memberships—compared with 278 last year—and 3,792 Class B memberships, compared with 3,388 last year. Class A and B memberships this year total 4,078, and Membership Committee Chairman E. E. Whitworth, PG and E, states that the drive is not yet over. Vice-chairman is E. H. Galchutt, Graybar Electric Co.

Results of the regional meetings held by the Business Development Section were so outstanding that the board passed a recommendation that at least one of the three sections follow the same pattern and hold "road show" regional meetings throughout association territory next year. The directors also passed a resolution commending Vern Redman for the outstanding job he did as chairman of the Business Development Section and expressing the association's appreciation of his efforts.

Four fellowships were authorized by the board for technical research in proper school lighting, to be established at UCLA, UC, Stanford and USC. Funds for the fellowships will be underwritten by the PCEA and a committee will be appointed to work out a program for the ultimate financing of the project.

Convention and Annual Meeting—At this is written, the association's "vacation - convention" at Seigler Springs, Hoberg's and Forest Lake resorts May 13, 14 and 15, is taking shape as a new high in PCEA activity. The informal "summer resort" type entertainment and "open houses" are sure to be enjoyed by all. The program looks especially interesting and informtive. (EWEST, April, p 120.)

Last item of business at the convention will be the association's annual meeting at 11 a.m., May 15, at Hoberg's. The new president and directors will be elected and such other business as may require attention will be transacted. The nominating committee, consisting of F. A. Tracy, chairman; D. P. Cady; R. N. Dreiman; J. A. Longley; H. C. Rice; K. M. Ryals; S. W. Scott, has put the following members in nomination: For president, J. H. Pengilly, Square D Co., Los Angeles. For directors, C. C. Ernst, California Electric Power Co., Riverside; C. W. Goodwin Jr., General Electric Supply Corp., San Francisco; L. M. Guibara, United States Rubber Co., Los Angeles; G. N. Hawley, Southern California Edison Co., Los Angeles; R. G. Holabird, National Electric Products Corp., San Francisco; R. D. Moody, Allis-Chalmers Mfg. Co., Los Angeles; E. D. Sherwin, San Diego Gas & Electric Co., San Diego; N. R. Sutherland, Pacific Gas and Electric Co., San Francisco; G. C. Tenney, McGraw-Hill Publishing Co., San Francisco; C. A. Wikle, A. S. Schulman Co., Los Angeles.

Schultz Boals

Ries Slatt

Adams Lehman

Public Power E&O Group Meets

Metering and relaying, distribution practices, television interference, substation design and grounding practices were principal topics covered in a day-and-a-half meeting of the Engineering and Operation Section of the Northwest Public Power Assn. held in Eugene, Ore., April 16 and 17. Prof. F. O. McMillan, Oregon State College, guest speaker at a banquet, chose as his subject "The Engineer as an Administrator." He outlined the attributes of a good administrator and then asked the question, "Does engineering training provide a good background for an administrator?" He answered the question by citing figures from a *Fortune* survey showing that of 832 who gave information, out of 900 top executives from the 300 largest industries in the country, 521 or 63% had had four years of college training and of these 238 or 45.7% had engineering training. This is the more remarkable when it is considered that only 9% of college graduates are engineers. Executives in the utility field have the most education, he said, but are the poorest paid.

Engineer's Role

Another role of the engineer, that of reducing unit costs, was discussed by Sol E. Schultz, Bonneville Power Administration. The engineer is responsible for 90% of the utility budget, he said, and therefore his role is most important. The speaker went on to analyze the opportunities the engineer has for lowering costs, increasing efficiency and reducing losses. One of the engineer's greatest fields is that of distribution, he said. Investment in distribution generally exceeds the cost in generation and transmission and therefore small gains in efficiency are most important. Schultz said that in 1957 the Northwest power grid will require a Bonneville plant (517,000 kw) to supply transmission losses, hence savings in losses are important.

In the session on metering and relaying it was first determined that it was the desire of the group that a meter school be held. Gus Norwood, association manager, said that he would try to set up such a school for early September on the Oregon State campus. Another is planned for Washington State University later.

Experience was exchanged on the field testing of residential meters. J. D. Cockerell, Tacoma City Light, described that utility's meter-testing van. With this mobile unit he said four men had tested 12,976 meters, or 51.7 per day, at a cost of $1.23 per meter for labor only. The mobile unit, costing $7,000, has been found to be the most economical method for field testing.

Television

An entire session was devoted to television. Julian Whaley, Seattle City Light, reported on interference handling practice in the primary service area of station KING, Seattle. He said that the time of one man with specially equipped truck is required for 200 hours per year to handle interference complaints from the 233,000 set owners in primary service area of Seattle's only TV station. Where interference is traceable to power lines, Whaley said that bonds, hardware and ties are the chief offenders. Tacoma uses a standard report form for TVI. In this area it was reported that 46% of complaints resulted from power line interference. Loose ties on an old 26-kv line gave most of the trouble.

Titus Hunnicutt

Charles Peck, BPA, had written to nine TV set manufacturers and five of these had no information on TVI. The others reported little trouble; all said they were trying to minimize interference in set design. One manufacturer reported that a sort of corona had given trouble.

Substations

The committee on substations under Fred Lehman had several valuable papers. One by Dick Stevens, BPA, dealt with flexibility in substation design. He made these points: flexibility is a compromise with cost; careful physical arrangement of buses and equipment should be considered for working on equipment; try to picture the ultimate plan so that expansion can take any one of several patterns; adequate land purchase is important; use of a building block design using standardized components is desirable; use package substations where appropriate; steel lends itself to flexibility but aluminum should also be considered; house only equipment that needs shelter; portable pre-

fab buildings offer large salvage value and adapt themselves to flexibility; and flexibility and extendability have not been overlooked by manufacturers.

L. H. Austin, BPA, gave a comprehensive paper on substation grounding practices. He said there were other considerations in grounding besides safety to life and property, such for instance as dissipation of steep wave fronts and control of transmission fault currents, but that the various objectives are not incompatible. To establish a ground grid of low resistance is the main purpose of grounding; employ a large ground grid of large area, he said. If resistance is too high, the answer is to increase area and depth but, of these, depth is the most expensive and least effective. Increasing area is the cheapest and most promising. A most worth-while contribution on practical methods of making ground resistance tests was made by A. L. Kinyon, BPA.

John Albi, Seattle City Light, reported for the safety committee. He stressed the importance of working with labor on safety rules, particularly in the writing of rules.

T & D Committee

The committee on transmission and distribution practices, Elmer Titus, chairman, had papers and discussion on low-voltage motor starting and on primary and secondary fusing. C. B. Hinton, G-E, Seattle, in his paper on reduced-voltage motor starting, gave data to be used as a basis of estimating voltage dips resulting from full-voltage motor starting currents; suggested that data be compiled on voltage-dip complaints so that eventually it will be possible to establish a maximum acceptable voltage fluctuation, and proceed from there to set up criteria for reduced-voltage motor starting.

On secondary fusing, Snohomish PUD reported that secondary fuses are used midway between banked transformers and that no trouble has been experienced from cascading and the advantages of banking are still retained.

At conclusion of the meeting it was announced that next year's meeting of the E & O Section will be held in Seattle, about the same time in April as the Eugene meeting. Vincent P. Slatt, Inland Empire Rural Electric Co-op., Spokane, was elected to serve as chairman for the ensuing year. Registration at Eugene was 165, the largest so far in the history of the E & O Section of the Northwest Public Power Assn.

Ufer Osborne Lindsey Mrs. Ufer

All Quiet on Code Front as

Nobody seems very unhappy about the National Electrical Code in the Western states, if the series of meetings of Western chapters attended by Charles L. Smith, IAEI secretary-treasurer, gave a fair sample. There were questions of interpretation. With a preprint copy of the final changes for the 1953 edition in hand, Smith was able to clarify many of these by reading new wording suggested. Toward further understanding, he announced that Frank Thornton, recently retired Westinghouse codes and standards member of the electrical coordinating committee, had been given the task of rewriting the wording of the National Electrical Code and of removing its existing discrepancies between various articles.

Smith began his series of meetings with an informal luncheon at Phoenix with the members of the Arizona Chapter, April 4, presided over by M. V. Williams, chapter chairman. Some 25 or 30 attended and had general discussion of the IAEI activities and the proposed state code for Arizona. Successive meetings were held at San Diego April 8 with the Southern California Chapter, Barney Alverson, San Bernardino County inspector, chairman; Stockton April 11, a joint meeting of the Sacramento Valley, the Northern California and the Central California Chapters, presided over by Clyde Narvez, Richmond, Northern California chairman, J. P. McClure, Lodi inspector, Sacramento Valley Chapter chairman, and Ray Colby, Fresno, Central California Chapter chairman.

In Nevada the chapter meeting took on the proportions of a convention at Elko, April 17, with Howard Lindsey, California-Pacific Utilities Co., Winnemucca, chapter chairman. In Salt Lake City the Utah Chapter, meeting April 20, was presided over by Orion Eskelsen, Brigham. In Boise the Idaho Chapter met with Smith April 22, Floyd Warner, The Lighthouse, Kellog, chairman. Smith then went on to meetings of the Oregon Chapter at Portland April 24, Puget Sound Chapter at Tacoma April 25, Eastern Washington Chapter at Spokane April 27, and thence to Rocky Mountain Chapter, Denver, April 29 and Montana Chapter at Helena April 30. Reports from the last five have not yet been received but summaries of the highlights of the others follow.

At each of the meetings Smith summarized the activities of IAEI. He particularly invited all inspectors to attend the Silver Anniversary all-section convention of IAEI at Chicago Sept. 21-26. At this, special problems are to be treated by national authorities; particularly mentioned were to be a discussion of X-ray installation problems, another on motor control and protection, another on furnace control installations. The chairmen of all the code panels and the correlating committee on the National Electrical Code, he said, would act as moderators for sessions dealing with questions and answers on the code.

In each meeting he also presented a sound slide film prepared by the cord manufacturers' group for the public relations committee of the

Smith Muller Alverson

IAEI Meets

IAEI and made available to all of the chapters for presentation to luncheon clubs, PTA's, schools, etc.

Southern California Chapter—San Diego

Spray booths and trailers, perennial problems in southern California, came in for the most discussion at the San Diego meeting. Smith assured the inspectors that the new addition of the code would clarify the definitions of spray booths, spray rooms, and give consideration to water curtains and ventilation.

The permanent nature of so many trailer camps as well as the situation in and around Palm Springs, where people purchase lots in order to have a place to bring their trailers and spend the winter, has brought problems of demand factor to be applied to service equipment for trailers. The concern of the trailer manufacturers' association for the grounding problem was discussed and methods of bonding all-metal equipment and of grounding trailers were interchanged. Also announced were the preliminary plans for an interim meeting of the Southwestern Section at Santa Barbara July 20-22 to prepare any code changes thought desirable for those going to the Chicago meeting to take back with them.

Northern—Central—Sacramento

Less time was taken at the Stockton meeting on code discussion but administrative problems were the paramount issue. Herbert Ufer, Southwestern Section secretary, announced that the Hawaiian Chapter, on being polled, had expressed no desire for a separate section, preferring to remain in the Southwestern Section, but requesting that a new chapter be formed on Maui. A discussion also ensued on holding a section meeting either in Nevada or Arizona.

The administrative problem posed was that wound up with a trend to put electrical inspection departments under the building department and to subordinate electrical inspection. It was declared difficult to find the source of this movement, in order to reach that group responsible, and show that the technical nature of electrical installation required something far more than ordinary building inspection by unqualified inspectors. Smith declared that the short form code, which had been prepared at the request of the building officials' conference, was finding very little demand and seemingly was not much needed.

San Jose was selected by the three chapters as the site for next year's joint chapter meeting about the same time.

Nevada—Electric Heat

Grounding difficulties in dry desert, use of nonmetallic sheathed cable in cement-block construction and greater capacity for electric heating were the three major code topics brought out at the Nevada Chapter meeting at Elko, where J. Hyde Stayner headed a panel with William Ashe, Las Vegas inspector; Charles Smith, IAEI; Charles LeClare, Reno inspector; and Lester Johnson, G-E, Salt Lake City.

Consensus seemed to be that in a desert area outside walls of dwellings should be considered dry enough at all seasons for use of cable in the interstices of the cement blocks. Only difficulty came where the block walls are bonded together for earthquake resistance by means of a concrete beam. Through such beams conduit or steel tubing were recommended.

On electric heating, general experience indicated, said Ashe of Las Vegas, where more electric heating is used than anywhere else in the United States, a 100% wire capacity is required. The code allows 75% up to three appliances but where all the heating is done electrically this has not proved satisfactory. Another question raised was whether in a motel feeders to electric heaters need be limited to 240 v. The opinion was given that 440 or 480, up to 600 v, could be used if properly installed and protected, on fixed equipment. The 150-v-to-ground limitation, it was felt, was for safety in lighting circuits. Chairman Howard Lindsey said such a heating installation was contemplated in Winnemucca.

Methods to obtain ground in the desert conditions were extensively discussed. Harry Linnecke, contractor of Reno, described methods used at an ammunition depot. Ufer of Underwriters' Laboratories told that if some of the reinforcing rods in a concrete floor building were driven deep into the ground while the building was being poured, satisfactory grounds could be maintained for years afterward.

Other features of the Nevada meeting included a code breakfast, presided over by L. John Christensen, first inspector of Salt Lake City, now retired, filling it with helpful philosophy regarding code administration; an exposition of the details required to meet an Underwriters' Laboratories standard for lighting panelboards, given by Howard Dodge, engineer at the San Francisco laboratory; a luncheon address by Herbert G. Ufer, Western superintendent, Underwriters' Laboratories, secretary of the Southwestern Section and third vice-president of IAEI. He urged the training of younger men in the industry and setting of a good example. He also reviewed the starting of the Nevada and Arizona Chapters and commended the remarkable growth in both of them.

Prof. Charles F. Dalziel, University of California, gave a revealing account of the effects of electricity on man and animals, based on tests both at the university and at an eastern research project. He gave the current and voltage ratings at which shock became perceptible, then the limits of endurance. He also demonstrated the new resuscitation method now recommended by all agencies.

Idaho's experience with electrical inspection by the state was recited by Rankin C. Young, Boise, a state electrical inspector and president of the Northwestern Section. This proved particularly interesting to Nevadans because of their desire for some similar state inspection. He described the necessity for proper preparation of the public to desire and accept such a law, and told some of the financing problems for inspection in widely scattered communities of small size.

Contractors' license fees and journeyman licenses are insufficient to finance such a program and he told of Idaho's experience in finally achieving a regulation that allows a charge for inspection permits. The scale in Idaho, he said, is a minimum of $2.50, which is for a one- or two-room residence; $4 for a three- to five-room residence, and 50c for each room over five. The commercial and industrial rate is 1% of the wiring cost up to $10,000 and after that ½%.

He announced that Idaho would soon have eight inspectors in the state and especially urged that someone familiar with the electrical industry and understanding of the problem be supported in the state legislature. Likewise, he urged that whatever legislation is passed should seek to make the inspection self-supporting and likewise to keep inspection and license funds for inspection only and not allow them to go into the general fund at the end of each year. Thus, some cushion is allowed for lean periods when inspectors must be kept on.

At the conclusion of his talk, a resolution was adopted unanimously that a committee be appointed to study the matter of a state law for Nevada and to discuss details of it at the next meeting.

As this was the annual meeting of the chapter, elections were held. A. L. Pierce, Sierra Pacific Power Co., Reno, was elected chairman; Lynn Steiner, Ely Light & Power Co., vice-chairman; W. W. Murdoch Jr., engineer, Elko-Lamoille Power Co., secretary-treasurer; with an executive committee consisting of William Ashe, Las Vegas, Harry Linnecke, Reno, M. E. Lundberg, Elko, R. L. Osborne, Reno, Prof. I. J. Sandorf, and Mr. Couch. The next year's meeting place will be Winnemucca with Howard Lindsey, the retiring chairman, as host. Attendance at the code breakfast was 58 and the banquet 112, at which W. A. Cyr, associate editor of ELECTRICAL WEST, gave a humorous address, "Is the World Completely Nuts?" An exhibit by some 8 or 10 manufacturers gave the visitors an opportunity to see new wiring materials and devices. R. O. Osborne, Osborne & Dermody Co., Reno, arranged the exhibit. M. E. Lundberg was general chairman.

Hicks Forte Pry Young Warner

In Utah—Gas Stations

Most clearly presented and diagrammed code topic at the Salt Lake City annual meeting of the Utah Chapter, presided over by Orion Eskelsen of Brigham City, was Les Johnson's discussion of Art. 5141-5143 and 5014, 5015-5027 dealing with the wiring of gasoline dispensing islands. He diagrammed the code rules so that all could see what was intended by the wording, showed the places for sealing the wiring, discussed conductors approved for the purpose, told of switching and control requirements and generally cleared the air on this often controversial subject. Charles Smith, IAEI secretary, brought in the new wording of the proposed changes to the code which will further clarify some of these problems.

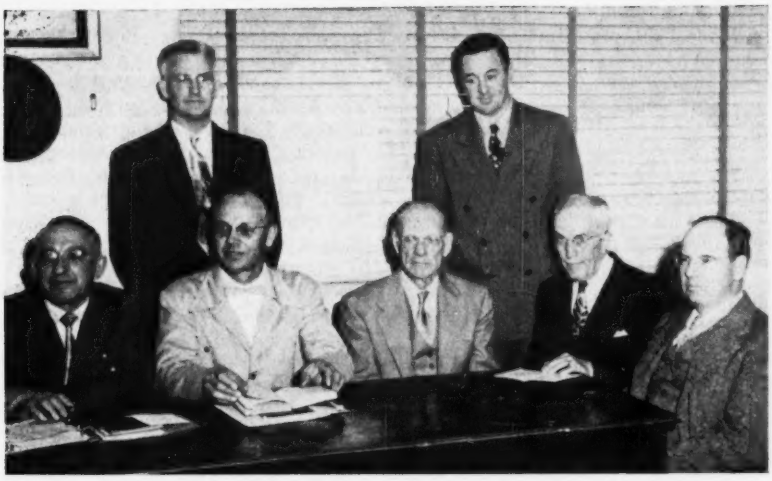
The other code discussion followed various articles of the code and was quite general in its coverage. L. John Christensen prefaced this session by discussing some of the fundamentals behind the code rules. Some question arose as to whether copper pipe for a water system with sweated joints could be considered a satisfactory ground when the water is often drained from the system in cold climates to keep it from freezing. Interpretation was also asked as to how much ventilation is required where Askaral-filled transformers are used.

The first session was addressed by H. G. Ufer on the value of Underwriters' Laboratories listings and the public relations committee film of IAEI was presented by Smith. The group joined the Intermountain Electrical Assn. at a luncheon, presided over by Mark Austin, Sunbeam Appliance, league chairman. Dr. L. Roy Nelson, director of Bureau of Business Research at University of Utah, gave an enlightening picture of the economic changes taking place in the Salt Lake area. Among factors he noted was a drop-off in contract construction in the area with fewer building permits and significantly three times the number of building permits in the county as in the city. This indicated only one-third of the dwelling units are being built within the city limits at the present time, a trend noted in many cities.

L. M. Christensen, Salt Lake City chief inspector, was elected chapter chairman; M. W. Silver of the Salt Lake City Department first vice-chairman; Ernest R. Anderson of Telluride Power Co., Richfield, Utah, second vice-chairman; and A. E. Fleming, G-E Supply, re-elected secretary-treasurer.

Dr. Adam Bennion presided at the evening banquet, which he said would represent his last time as a member of the power company. He has recently been elevated to the apostleship of the Mormon church and will soon

Steiner Lindsey



Standing, McBride, Narvez; seated, Jarvis, McClure, Colby, Smith, Bliss

leave the power company. He paid tribute to the people of Utah and held great promise for the future for the young men of the industry.

Main speaker of the evening was Frank E. Young Jr., branch manager, Westinghouse Electric Supply Co., whose talk, "Inspection and Electrical Progress," reviewed history of alternating current development by Westinghouse, Goulart, Stanley and Bellfield, and then told of many modern advances in electrical development. The electrical inspector, he said, had a very definite part in this chain. W. A. Cyr gave a short skit, kidding television antenna installations and periscope service entrances.

Idaho Expects TV

With two television stations building and due to be on the air in July in Boise, great interest centered in television antenna installations and whether they should be under the jurisdiction of electrical inspectors, at the Idaho Chapter meeting, presided over by Floyd Warner of Kellogg, Idaho. The Idaho meeting was held in Boise.

A question as to whether an ordinance should be enacted requiring the grounding of antennas brought from Charles Smith, IAEI secretary, a strong recommendation based on unfavorable experiences in many eastern cities. He told of a case where $32,000 in damages were collected from a fire caused by an improperly installed TV antenna. The "recourse of neighbors" common law, he said, would make it very serious for persons doing damage to neighbors' property through their own negligence.

Cases of antennas being blown over on power lines were numerous, some even bringing fatalities. He stressed the new revision of Art. 810 with specific mention of TV and the requirement that antennas be kept away from power lines, be properly grounded for lightning protection and be firmly guyed to withstand wind and snow loading. Ordinances have been enacted in many cities, some placing the installation under the building department, some under electrical inspection. In Denver, it was said, the ordinance was linked with sign installations.

The question was particularly pertinent in Idaho because of the controversy that had arisen when the state inspectors considered it their duty to supervise antenna installations in the northern part of the state. This was strongly protested by appliance dealers and no further action has followed.

In a lighter vein, W. A. Cyr, ELECTRICAL WEST, treated of strange TV antenna installations in relation to periscope service entrances at the evening banquet. Other code discussion at the Idaho meeting was varied and covered a great number of subjects. Smith acted as moderator with a panel consisting of L. B. Johnson, G-E, Salt Lake; Mark H. Lundy, state inspector; E. E. Haroldsen, Idaho Power; Park H. Forte, Boise city inspector. Questions were numerous and discussion was lively but no controversial issues appeared.

Outstanding feature of the entire meeting was a heart-to-heart talk by Britt Nedry, director of the Bureau of Occupational Licenses of Boise, who as secretary of the state senate had a front seat, he said, and heard many of the professions gone over at the recent session of legislation.

He reminded that all licensed professions are under very close scrutiny throughout the nation. The Council of State Governments has criticized the form of operation of this "fourth branch of government." Criticism has been raised that the personnel becomes bureaucratic through the years, becomes officious and Jehovahlike, making decrees and dictates. He urged that professional groups examine their procedures and if possible operate under state scrutiny, to be sure to maintain the interest of the public safety, welfare and interest. The need of good public relations was paramount, he emphasized.

With a tremendous increase in number of farm pumping plants for irrigation in parts of Idaho, Ralph Foley, Idaho Power Co., Twin Falls,

Ufer Eskelsen

Christensen Silver Anderson Fleming

gave a short talk on the necessity for grounding of motors and irrigation pumps. This paper will be published later in full in ELECTRICAL WEST. Since the generators and transmission lines are grounded, the necessity for grounding the equipment also has been tragically demonstrated in a couple of fatalities to farmers contacting the motor case of a defective motor.

Howard Dodge, Underwriters' Laboratories, San Francisco, gave the same presentation he had made at Elko on "What's Behind a U. L. Panelboard Label." J. Carl Baldridge, Idaho state electrical inspector, discussed the narrow escape the Idaho electrical law had had at the last legislature when a motion to repeal it was introduced. He also explained the necessity for the recent regulation approved by the attorney-general allowing for permit fees to help support more state inspection.

As this was an annual meeting also of the Idaho Chapter, election of officers placed Park Forte as chairman, and district vice-chairmen elected were Gaylord Denison, state inspector, Lewiston, District 1; Clyde Hicks, city inspector, Nampa, District 2; Charles Davis, superintendent, Light & Power, Burley, District 3; Forrest S. Pry, state inspector, Blackfoot, District 4. Rankin C. Young, state inspector, Boise, was re-elected secretary-treasurer; and on the executive committee Floyd Warner, past-chairman, Hy Hansen, Idaho Falls, and H. L. Baker, Lewiston.

Banquet address was given by Edson H. Deal, lt. governor of Idaho, who spoke of the heritage the pioneers of Idaho had left for the present generation and the responsibilities attendant on living up to that heritage. William A. Hopper, Gem Electric Co., was toastmaster.

Oregon Chapter—Smith Night

No attempt at technical or code discussion was made at the Oregon Chapter meeting. Instead it was "Charlie Smith Night," at which the inspectors and members and their wives gathered at a dinner to honor Smith and to hear from him the details of the forthcoming all-section convention at Chicago. He also presented the sound-slide public relations committee film and talked of association affairs and in general of some of the changes in the forthcoming code. Cliff Atkins, state inspector of Oregon, chairman of the chapter, presided. Some 71 were in attendance. The Oregon-Columbia Chapter of NECA joined the IAEI for this occasion.

Following this, Smith held meetings with the Puget Sound, Eastern Washington, Montana and Rocky Mountain Chapters but accounts of these meetings must wait for another month.

EMEA

Aluminum conductors in industry were described to the Electrical Maintenance Engineers' Assn. of Northern California at its April 16 meeting by Arthur Craig Jr., sales engineer, Aluminum Co. of America. The previous meeting was a tour of Bethlehem Steel plant at South San Francisco, arranged by John Kyes of Westinghouse Electric Corp.

EMEA of Southern California heard about the possibilities of magnetic amplifiers from F. M. Dorey, General Electric Co., at its April 15 regular meeting. Summary of the recent conference shows 108 industrial plant electrical maintenance personnel attended. Some of the papers presented at the forum sessions will begin to appear in ELECTRICAL WEST next month.

Contractors

Electrical Contractors' Assn. of British Columbia elected S. C. Muskin president succeeding R. Beaumont. Other officers are L. A. Gibberd, Penticton, vice-president, Southern Interior Electrical Assn.; W. Lockley, Mission, second vice-president, Central Fraser Valley Electrical Assn.; George Bailey, Alberni, third vice-president, Alberni District Electrical Assn. Secretary-treasurer is J. R. Dooley of the Electrical Service League.

Mid-Island Electrical Assn. of British Columbia elected R. H. Barr to succeed R. Rathlef as president, G. Lowe, vice-president, and S. G. Carlson secretary-treasurer, with headquarters at Nanaimo.

Edmonton Electrical Contractors Assn. elected W. Got to succeed E. S. Sunley at Edmonton, Alberta. R. A. Crowley is vice-president, C. T. Hillas, secretary-treasurer.

NECA

Final details are being worked out for the two National Electrical Contractors Assn. district meetings, District 6 at Vancouver, B. C., May 7-9; District 8 at Billings, Mont., May 15-16. Paul Geary, executive vice-president, and E. R. Cornish, director of research and education, are to be among the speakers bringing national information to the chapter representatives in attendance.

Rocky Mountain Chapter, NECA, held its annual meeting for architects and engineers May 7, at which the feature attraction was Public Service Co. of Colorado's lighting show.

Northern California Chapter, NECA, had an equally successful joint meeting with the East Bay Chapter of American Institute of Architects in March, at which architects, consulting electrical engineers and contractors formed a panel to give views and answers on a list of questions prepared by each of the groups. E. L. Buttner, NECA vice-president, District 6, also spoke on the NECA legislative program and the interest which each group in the building industry should have in its passage. Representing electrical contractors on the program were Walter Vance Jr., who acted as co-chairman of the program; George Curran, Red Top Electric, Emeryville; Steve Lindheim, Schwartz & Lindheim, Oakland; Walter Smithen, T. L. Rosenberg Co., Oakland; Don Pearce, Stanley Pearce Electric, Vallejo; Frank Gadsby, Matson Electric, Oakland. Electrical engineers on the panel were Birger Duvander, Scott Beamer and John Willegas. Vic Perero, president, Northern California Chapter; Ralph Askin, chairman, Alameda County Branch; and Joe Barnes, chairman of Contra Costa County Branch, shared the head table.

Shelby Wiggins becomes the new manager of the San Diego Chapter, NECA, as Joe Bollinger joins the staff of Matt Sherwood, Western director, as a field representative of NECA for Districts 6 and 8. Bollinger will be attached to the San Francisco office. Wiggins is a man experienced in taxation and legislative matters and formerly was with the American Petroleum Institute.

IES

"My Most Interesting Lighting Job" competitions were the featured event at several of the IES sections and chapters just prior to the two regional conferences, which are reported on p 95. Winner of the first award for northern California was Merrill Humber, who also won in the runoff between the chapters and sections of the South Pacific region at the meeting in Los Angeles. His presentation, "Lighting the Broadway Tunnel" is to be found on p 88 in this issue. Second award went to Raymond Benton, third to R. L. Sawyer, with honorable mentions to S. P. Russell, A. R. Parker and Herb Kaewert. There were 16 entries in the northern California section. At the presentation dinner March 12, officers of the Mother Lode and San Jose Chapters were also present.

Southern California section winner was Oscar W. Meissner, who also won

second place at the regional conference. His entry covered the unique lighting for the drafting room of Western Precipitation Co., Los Angeles, and will be published next month. Harold F. Hall, Southern California Edison Co., took second place and Richard B. Hatfield of the same company third place in the Los Angeles contest.

ESL

Electrical Service League of British Columbia elected W. W. Foster, British Columbia Power Commission, as its president and chairman succeeding Howard N. Walters, general sales manager, B. C. Electric Co. H. H. Horsman was named vice-president and J. R. Dooley secretary-manager. R. Hall, who has been secretary-manager for many years, had to retire on account of illness. On the council are T. H. Crosby, Canadian Westinghouse, S. H. Grisdale, Canadian General Electric, Charles Woogar of Northern Electric, W. C. Mainwaring of B. C. Electric, Victoria, and H. J. Gough, Gough & Sons.

AIEE

John M. Nelson, assistant superintendent of Seattle City Light, was elected chairman of the Seattle section and W. J. Smith, secretary-treasurer, J. V. Lamson vice-chairman.

● **Earl S. Condon,** Los Angeles manufacturer's representative, was elected president of the Electrical Equipment Representatives Assn. for 1953 at the group's recent annual meeting at Palm Beach, Fla. He will preside over the July meeting of the EERA at Colorado Springs and its annual meeting in Los Angeles next February.

William Klose of San Mateo accepted another term as president of the Peninsula Electrical Contractors Assn. at the annual dinner given to the entire industry by the organization recently. At the head table, left to right—Louis Rolla, former president, now treasurer; Mrs. Clelia Maioli, executive secretary; President Klose, standing; W. J. Varley, manager and William Kennedy, vice-president. At the same occasion Seth Cohn was presented with a commendatory resolution for his apprenticeship committee work

E. T. Pridemore, president, San Diego NECA, left. Shown right are Joe Bollinger, new field representative, District 6 and 8; Shelby Wiggins, now San Diego Chapter manager

PAST PRESIDENTS HONORED—These past presidents of the Electric Club of Oregon were pictured recently: L. W. Going, W. A. Kenney, F. E. Webb, Walter W. R. May, R. H. Sroufe, Corbett McLean, D. O. Bergey, Theron W. Fitch, J. B. Buman, L. C. Stewart, R. C. Kenney, C. A. Comstock, F. H. Murphy, E. F. Pearson. Dan Webster is president of the group this year.

ELECTRICAL WEST

Losers All

THERE is always the inevitable morning after for every labor dispute such as the strike against the Southern California Edison Company, which is described elsewhere in this issue. Everyone loses in a strike of this kind. Striking employees lose probably most of all. Such disputes are terribly expensive economically in their waste of material and human resources. They are expensive too in the loss of mutual confidence and understanding—a loss that will be felt long after the dispute is settled. Then there is the loss of self-respect in the people who under emotional stress do and say things on the picket lines for which they would be deeply ashamed under normal circumstances. In the face of these facts the aftermath of a strike makes everyone the loser.

Roanoke Sets a Precedent

A STUDIED and impartial appraisal of the Supreme Court's decision in the Roanoke Rapids case raises hope for an early resolution of the difficulties that are holding up private development of two notable Western projects — Kings River and Hells Canyon. In upholding the Federal Power Commission's license to Vepco, the court established the fact that private capital not only has some rights but that it must be reckoned with in any plans for river development. At least applications for private power development will get a sympathetic hearing whenever a proposed project is consistent with the over-all federal plan for river basin development.

In the case of both the Kings River and the Hells Canyon projects the proposals of the private tax-paying utilities would develop as much or more power for less money than the plans of the U. S. Bureau of Reclamation. Nevertheless the Interior Department has attempted to pre-empt power rights on both streams on the grounds that river basin planning and development by the federal government ruled out private agencies. The court decision takes the more sensible view that there still remains an opportunity for a working partnership which will allow power companies to develop the electric energy on a regulated, tax-paying basis.

The Kings River case is being tried in the federal district court. Hearings on the Hells Canyon project and the associated developments on the Snake River begin shortly before the FPC. Favorable decisions in both instances seem assured if the Roanoke Rapids case can be taken as setting a precedent.

Ex-President Hoover on Power

AS one of the two primary regions in the vast and growing federal electric power empire the Far West has a special interest in last month's recommendations by former President Herbert Hoover. Decrying the "creeping socialism" of the federal power program, the nation's foremost elder statesman called upon the government to "get out of the business of generating and distributing electric power" and to turn it over to tax-paying industry or to state or local agencies.

Coming from an ardent conservationist and a keen student and critical observer of government affairs, the speech outlines procedures that might well be incorporated into a new federal electric power policy. Mr. Hoover made three basic proposals: (1) that no more Congressional appropriations be made for steam or hydro plants solely for power; (2) that future multipurpose projects be denied funds unless Congress is certain that any electric power to be generated is first leased to private utilities or to municipal, state or regional agencies; and (3) that a commission appointed by Congress study and reorganize the whole federal power venture.

Mr. Hoover spelled out the powers that should be vested in such a commission. It should "formulate the methods and standard terms for leasing generating plants, transmission lines and the electric energy to private enterprise or to municipalities or to the states or to regional authorities that may be set up and managed by the states. These standard terms should provide for payment

EDITORIAL VIEWS

of interest and amortization of the federal investment, the refunding of arrears in these items and also some contribution in lieu of taxes. The latter would not need to apply in case of private enterprises as they pay their own taxes." Other commission duties would be to revise accounting procedures for allocating costs between functions of multipurpose projects and to develop means whereby nonfederal agencies could share cooperatively in the costs of electrical features of such projects.

In its approach to power appropriations in the current budget Congress already has shown a tendency to follow some of Mr. Hoover's suggestions. It should go the whole way by implementing the commission he urges.

Commercializing Atomic Power

COMMERCIAL generation of electric power from atomic fuels may be expected within two or three years. Whether one of the first stations to be erected will be in the Far West, as we have predicted, remains to be seen. However, several recent developments have cleared the way for industry actively to plan on owning and operating nuclear plants.

Liberalizing the law governing atomic controls has been proposed by the AEC itself. Four revisions are in prospect that will open the field to private participation. Licensing private concerns to own and operate reactors and to have critical quantities of uranium in their possession is one step. Another would permit companies to produce plutonium and other fissionable materials and also permit government to enter into long-term contracts to purchase such materials from private industry. It is also proposed to grant patent protection for research in the atomic power field.

All of these modifications will help to remove some of the barriers that have held back from the public some of the tangible contributions atomic developments might make to the general welfare. An equally significant recognition of a new era in atomic applications is the formation of the Atomic Industrial Forum Inc. It will be the nation's first industrial atomic energy association and it will function much like the Edison Electric Institute.

So as blasts from new atomic weapons continue to light the skies above the Nevada desert, there is growing evidence that the emphasis on atomic energy may be slowly changing from war to peace.

ALL of us as shareowners of business enterprise and as taxpayers are faced with the serious continuing problem of the tax burden. Taxes for necessary service of government, including national defense, we must afford. Taxes for waste or for unnecessary governmental ventures we cannot afford if we are to check inflation and preserve a strong economy built upon individual thrift and savings. Many leaders in government are making valiant effort to spend wisely and to conserve public money to the end that tax reductions may soon become feasible. Pressures are strong against them, and the shareowners of business enterprise must continue to give these representatives constant encouragement and support. You and I must not become the victims of lethargy. Neither must we be lulled into passiveness in the false hope that socialistic trends, so marked in recent years, have been overcome. There is no doubt that the majority of the American people believe firmly in the enterprise system of business, agriculture and industry, but that belief is not a constant guarantee against socialistic encroachments. It is only through keeping alert and keeping active in behalf of taxpaying enterprise that shareowners of business will do their full duty to preserve it. This is not the time to relax, for eternal vigilance is the price of keeping our nation and our business enterprises on their historic path.—T. E. Roach, president, Idaho Power Co.

Mrs. Fenner Mrs. Sweeney

How PG and E Compared With National Average

	National Average in 1951*	PG and E 1952
Number of residential electric customers	399,567	1,157,175
Total number of contacts	51,776	87,470
Average number of contacts per home economist for year	2,893	12,496
Average number of contacts per home economist per working day	13.7	52
Total number of group activities	606	1,434
Total attendance at group activities	31,865	85,179
Average number of group activities per home economist	40.7	204.9
Total cost of home economics program (including general office staff)	$97,646.00	$66,277.00
Average cost per residential customer	$ .30	$ .057
Average cost per contact (based on cost of field program)	$ 2.79	$ .574

* National average figures are based on figures for 34 electric companies reporting in the Survey on Home Service Activity completed by M. E. Skinner, Union Electric Co. of Missouri, covering activities in 1951.

Home Service Program Wins McCall Award

An over-all home service program stressing mass education and promotion won the 1952 Laura McCall Award for Pacific Gas and Electric Co.'s home service director, Marguerite Fenner. Only four-time winner of a McCall home service award, Mrs. Fenner was presented with a bronze plaque and a check for $200 at a special ceremony on April 1 during the Edison Electric Institute's 19th Annual Sales Conference in Chicago.

Elizabeth Sweeney Herbert, household equipment editor for *McCall's* magazine, made the presentation.

PG and E's entry, submitted in division A in competition with home service directors having five or more assistants, emphasized the far-reaching effectiveness and comparative low cost of its program, compared with the conventional type based mainly on home calls and individual contacts.

The story was told convincingly in actual figures of the department's accomplishments for the year and a comparison of these figures with national averages for 1951. The latter were based on a survey of home service activity in 34 electric companies conducted by M. E. Skinner, Union Electric Co., St. Louis, Mo.

According to the report, PG and E's staff of seven field home economists made a total of 87,470 customer contacts during 1952. Of this number, 85,179 contacts were made through group activities that totaled 1,434 in number.

Taking the averages per home economist and comparing these with the national averages, the report reveals some significant facts. For example, the average number of group meeting for each home economist in the PG and E group was 205, as compared with the national average of 41. The average number of contacts made by each PG and E home economist per working day was 52, the national average was 14.

Cost Figures

Figures representing the cost of home service activity were also given. The average cost of the PG and E program per residential customer was slightly less than $.06 for the year. According to the survey for 1951, the average for the 34 companies was $.30. Even more significant are the figures for average cost per contact made: $.58 for PG and E; $2.79 for the national average. This shows the effectiveness of the company's home economics program in terms of the number of consumers reached per dollar spent.

Every home economist on the PG and E staff is carefully selected and must meet high standards of ability, maturity, judgment and personality. She must be a Home Economics graduate, with several years of experience in a similar type of home economics work or in teaching. In compensation, the minimum salary for home economists at PG and E in 1952 was higher than the average maximum for the 34 companies in 1951.

Summary of Field Activities—1952

		Number of Meetings	Number of Contacts
Cooking schools		52	25,609
Equipment demonstrations		55	3,229
Special promotion, table setting festival		1	15,000
Radio and TV, fairs and exhibits		59	?
Other special activities		22	974
Lectures to adult groups		364	15,601
Lectures and demonstrations to home economics classes		784	22,757
Junior cooks classes		97	2,009
Total group meetings		1,434	
Total group contacts			85,179
Individual contacts			
Home calls	281		
School and club personnel	1,405		
Dealers	605		
Total individual contacts			2,291
TOTAL CONTACTS			87,470
Average number of meetings per home economist			205
Average number of contacts per home economist			12,496
Average daily contacts per home economist			52

Home economists Marian Arnott and Ethel Thomas give dryer demonstration to open . . .

Electric Living Campaign in Hawaii

Typical of an active promotional campaign being carried on in Hawaii by its PCEA Electrical Living Committee is the recent drive to promote public acceptance of another appliance—the electric clothes dryer.

Based on principles used years ago to pioneer and sell the washing machine, the two-month program was introduced by Committee Chairman G. Rinker, W. A. Ramsay Co., at a meeting for dealers and distributors in the Hawaiian Electric Co. Home Service Auditorium. It featured a free home demonstration under a cooperative plan between Hawaiian Electric and distributors and dealers.

The power company paid the cost of installing a 120/240-v circuit and revision of the meter loop if needed. The individual distributor or dealer chose the electrical contractor, who made a permanent installation complying with NEC and local ordinances. The utility also conducted an advertising program by newspaper, radio and TV, with which dealers were urged to tie in, and made available its home service staff for demonstrations. Theme of the advertising campaign was: "Free Home Demonstration of the Electric Dryer — No Obligation — Wiring If Needed Free of Charge."

Dealers conducted the one-half hour, tested home demonstration, provided the 12 25x15-in. terry cloth towels used and left with the homemaker as a gift, and allowed the dryer to remain in the home for at least one week.

At the introductory meeting a demonstration was given by Marian Arnott, home economist for Hawaiian Electric, and Ethel Thomas, home economist for W. A. Ramsay Co. Movies and refreshments followed.

Members of the electrical living committee in Hawaii in addition to Rinker are: L. W. Clifford, Hawaiian Electric Supply Co.; O. Malini, Easy Appliance Co.; N. E. Surbaugh, Sears, Roebuck & Co.; J. Jorgensen, Von Hamm-Young Co. Ltd.; and F. H. Williams, Hawaiian Electric Co. Ltd.

Subcommittee members of the range-water heater unit were Clifford, Jorgensen and Williams, of the home freezer unit Surbaugh, Malini and Williams.

Following the promotion dates of the EEI Campaign Calendar, the committee program in 1953 will also promote the range and water heater and home freezer.

The power companies are contributing toward wiring costs for the range and water heater campaigns, $50 on the former and $20 on the latter. If they want to make the wiring free, distributors and dealers must assume costs above these allowances. Participating utilities are Hilo Electric Light Co., Waiahi Electric Co., Kauai Electric Co. and Maui Electric Co.

In Utah and Colorado

They get up early to sell in Utah and western Colorado. A series of breakfast meetings of electric appliance dealers was conducted in 20 places over the territory of Utah Power & Light Co. and Western Colorado Power Co., and completed last month. It was the annual spring tour at which the sales program for the industry was announced with the backing of the utility.

The theme "Tell Electric — Sell Electric" characterized this year's business development department program. W. A. Huckins, manager of the department; D. L. Holt, sales promotion director; Evelyn Hansen, home service director, and other members of the staff participated to outline the business potential in the territory during the year. A brochure giving the details of the program and the advertising that will be done during the year has just been distributed to all the dealers and distributors in the company territory.

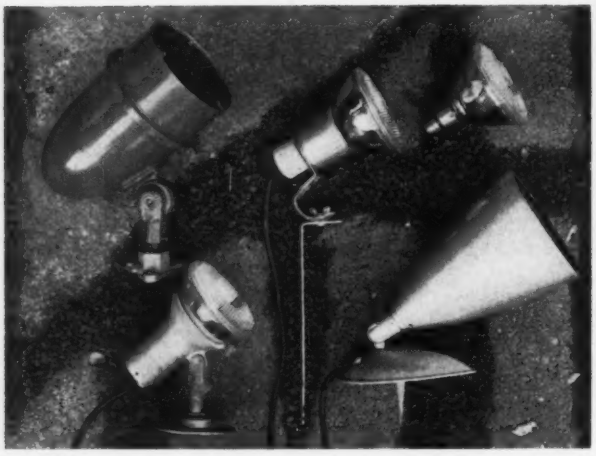
Charts of estimated sales and sales per thousand customers and of saturation gave dealers an opportunity to measure their own potentials on a basis of number of customers in their trading area. The sales training of dealer salesmen, adequate wiring program, home service activity, and then the potentials in commercial lighting, cooking, refrigeration, air conditioning were likewise explored.

Two other booklets have been prepared for distribution. The first, "More Light on your Streets," has been mailed to city, county and state public officials and key men of Chambers of Commerce and civic clubs in all the cities and towns served. It shows photographs of good street lighting installations and stresses the improvements in appearance and in business that such installations have brought. The second is a folder furnished to the home making department at the local high schools. It was especially prepared when the West High School homemaking department was remodeled and an open house was held. Acknowledgment of Miss Hansen's cooperation is given.

A single tree

Planter box

Nocturne window



With this equipment

A new made "moon"

Garden Lighting After "Sunset"

Ideas and means to be featured in the June magazine

Garden lighting, long dormant during the days of restrictions both on electric usage and materials, has almost become a lost art. But a new lease of life and light is in prospect as *Sunset,* the West's garden and home magazine, read so universally throughout the West, will feature several pages of garden illumination ideas in the June issue, now on the stands.

It will show effects achieved by the simple but effective use of PAR-type lamps in available types of portable or fixed mountings. To illustrate what can be done pictures of actual installations like those pictured here will be used. Then drawings will indicate how the lamps were placed to achieve the effect shown. Equipment that can be used will also be illustrated.

The pictures on this page are a few from the article. The first shows a Japanese dwarfed maple illumined from below by a reflector lamp in a torpedo type of holder that hides direct view of the light source. In the second, clamp-on sockets such as used by photographers hold PAR lamps that are concealed by shrubs in a planter box to silhouette camellias against a lighted wall, at an Atherton, Calif., home.

The third is the night picture from a window in the study of a Palo Alto architect, where an apple tree and geraniums in a window box are made to glow at night by concealed lamps. The round parchment disk is neither flying disk nor moon. It is a special means to diffuse light over a patio area. Suspended from the tree branches, it conceals some reflector lamps above the parchment or canvas circle stretched tight as a drumhead to a steel ring, as shown in the final picture.

The text will tell what it means to extend a garden's pleasure into the evening hours.

ELECTRICAL WEST Sales Guide

News Letter

May 1953

FOR THE ELECTRICAL MERCHANT OF THE WEST

Plenty doing in the appliance and television field even if sales aren't up to everybody's expectations. Business is spotty. Many claim business is good. Just as many more that it's bad. Small towns seem to suffer from too many dealers, the market from too many makes. It's the shake-down period and the best will survive.

Hellza-poppin'

Plans seem to be going through the wringer at present with the number of them dwindling. Credit is harder to get. Tightening up by the banks has thrown many for a loss. Others just overrode the boom. Advertising is being more carefully scrutinized by papers, who don't want a bad reputation. A pickup is expected by summer.

Freeze is on

Tighter money is making building a little slow also. Mortgage rates are going up and this is having its effect on new sales to new homes. Meanwhile many more manufacturers are going to get into the direct-to-builder appliance game, which some have capitalized. Naturally dealers resent it.

Mortgage money

Norge has been stamping serial numbers on its appliances as a means to help trace transshipping and removal of conventional serial numbers. Discount practices crop up in Seattle and Las Vegas. Dormeyer has joined manufacturers fighting in the courts against price cutting under Fair Trade and obtained injunctions against Dooley's and affiliated stores. G-E has filed against Charles Remer Co. and Vernon Sales Co. The Sunbeam case against the Grayson-Robinson stores is still in the courts.

Unfair trade

Thor too will go "show business" as its whole day-long stage production reaches San Francisco May 8 with T. R. Chadwick, general sales manager, in charge. Some 600 distributor representatives will have seen it before the show closes. With a full appliance line now, special emphasis is around the built-in electric range models which come in various colors. What effect the Thor full-line policy would have on present distributors with competing lines was speculated but John R. Hurley, Thor president, felt the range line, being completely a built-in one, would not conflict with conventional electric ranges. Neither would selling of other makes of refrigerators influence handling of the washer-dryer line. Thor also announced a new direct-to-builder packaged plan for selling combinations of appliances to tract builders.

Thor on the march

Sunbeam has done away with the cloth filter and now offers a stainless steel permanent-type filter with its Coffeemaster.

Filter

TV

The RTMA joint conference in Los Angeles April 16 was very color-conscious. Opinions differed as to how far away general color transmission and available sets were. Tube making was said to be the bottleneck. Joe Marty Jr., Admiral Corp., predicted none before 1955. RCA is filing a petition with FCC for a review of the color situation. Meanwhile it has obtained five patents. . . Pioneer Electronics Co. of Santa Monica wants a showing before FCC of any basically different color tube and circuit. . . Meanwhile ABC has been making some three-dimensional broadcast tests in Los Angeles. Polarized glasses are needed as in movies. . . J. M. Tuttle, Motorola Western sales manager, told Inland Empire Electric League by 1970 there will be "feelies" to give the feel or lift electronically as well.

news

A money-back guarantee has been made by Emerson Radio until June 30, 1954, to protect black-and-white TV purchasers against the advent of color. Certificate will guarantee that a purchaser of any 1953 Emerson TV will receive the total purchase price paid as partial payment on any color receiver, regardless of make, before the date given. Ben Abrams, president, predicted color available early in 1954.

flashes

Much going on in rushing new stations on the air. Both Denver stations increased their power. Los Angeles is to have a second UHF station in July. Phoenix expects a second station soon. . . In Twin Falls, Idaho, a mobile unit has been offered as a means to get TV there in a hurry. . A fight over a disputed channel in Las Vegas was ended when Greenspun, publisher, Las Vegas Sun, withdrew his application and joined KLAS to get the station o.k.'d sooner. . . FCC granted Howard-Yale Inc. of Palm Springs authority to build a booster station atop Howell Peak to bring in LA signals. . . Another station due in Salt Lake on Channel 2 within the year. . . Time Inc. purchased the Intermountain Broadcasting & TV Corp. of Salt Lake, Station KDYL. . . Tulare expects its station to begin telecasting this fall and Fresno's station KMJ-TV beginning date was advanced to June 1.

Static on the TV

New TV sales boom is short-lived most everywhere as new stations come in. The sales zoom to saturate the eager-beavers who want sets and then settle down quickly. Unfortunately, nobody is selling the programs and entertainment, only sets. As a result, in Portland TV sales have descended to extravagant discounts and give-aways, not only of free antenna installation but discount on top. New association formed there has been doing negative selling to warn people against gyps and fast deals instead of promoting more TV viewing and enjoyment.

Example

Example of sensible promotion: Distributors and dealers furnished all schools in a Western city with TV sets for assembly halls so that the children could see President Eisenhower give his address.

Color is back

Color TV sprang back into the limelight as NPA put an end to its controls on equipment for the color systems. However, Columbia, who had an o.k. from FCC for a noncompatible whirling disc system, seems ready to join the other manufacturers for an electronic system being developed by an industry-wide committee.

Figures tell

Dealer profits weren't too hot in 1952, the recent survey conducted by National Appliance & Radio-TV Dealers Assn. discovered. Average net operating profit ratio was 3.2 compared to 2.9 in 1951 and 6.0 in 1950. Dollar sales in 1952 expanded 8.8% over 1951. Turnover rate increased, cost of goods sold ratio declined for second consecutive year. Rising operating costs, price cutting, excessive trade-in allowances and shortage of good sales personnel were given as causes for low profits.

Bill Blees, Crosley's sensational vice-president, came West with a new line of laundry equipment to show distributors. Four new washing machines and gas and electric dryers. Looks like they were made by Bendix, another Avco subsidiary. Four washers are of the tumbler type, one with agitator and rubber tub. — In the wash

Sears-Roebuck is showing all over the country a new Kenmore electric range equipped with Sylvania's infrared lamp top heating unit of 1550 w with the special Vycor glass and built-in metal reflector for even heat distribution. Ease of cleaning and visible heat output degree are two major customer benefits. — Glass units

Thermador has added a small two-unit cooking top for use where space is limited. It is a built-in stainless steel top similar to the four-unit packages and the units equipped with five-heat switches. Can be installed individually, in pairs or divided wherever desirable. — Twin unit

Quality Television Corp., 1235 E. Olympic Blvd., Los Angeles, is now distributor for Dexter washers, ironers and dryers in southern California, exclusive of San Diego and Imperial Counties. It also distributes DuMont TV. . . Hallicrafters has named General Products Co. of Honolulu as distributor in the islands. — Distributors

H. L. Hoffman has appointed Paul E. Bryant as general manager of the company's Los Angeles distributing organization, known as Hoffman Sales. He was formerly western sales manager of Zenith and prior to that was with Herbert H. Horn Inc. and Leo J. Meyberg Co. — New post

Boyd Distributing Co. of Denver held a grand opening of its new 30,000-sq-ft, single-story building at 1661 W. 3rd Ave. in April. Cecil H. Boyd, president, said the company had increased 33 times in dollar value since operations began in 1945. Features of the new building are an auditorium for dealer meetings with gas and electric kitchens. Distributor-handles the Norge line as well as Motorola. — Open house

New policy has been established for repair of General Electric appliances in San Diego. A complete customer service department known as Metropolitan Service was established April 1 at 1764 Kettner Blvd. — Service

Among the new new products of interest are: Manning Bowman Division of McGraw Electric has a new four-purpose vibrator small enough to fit into the palm of the hand. It also has an efficient "guard-guide" knife sharpener in a clean white plastic case. Vibrator retails $8.95, knife sharpener $12.50. . . Haydon Mfg. Co. has a new range timer with an erasing dial that gives clear indication of the time left before completion of cooking. . . Two rotisseries are announced by Superstar, made by Stern-Brown of Long Island City. One is an automatic rotisserie-barbecue-broiler-grillette combination at $69.95, the other a similar one at $62.95. . . Just what is needed for modern lighting is Angle-Lite, a portable fixture that can be used over workbenches, beds, under cupboards, etc., or in any position, made by Winfield Inc., 1934 W. North Ave., Chicago. . . Lectro Speed Co., makers of water heaters, of Portland has a new booster heater where large quantities of high-temperature water are needed. — Among the new

Marguerite Wall, secretary to J. Clark Chamberlain, Bureau of Home Appliances, San Diego, is chairman of a new chapter of the Electrical Women's Round Table just formed in that city. Other officers are Wilma Breedlover, Alice Mathieson, Margaret Hull. A 3-year-old organization, the Home Consultants Assn., was converted to the EWRT. — Gals organize

Show dates for the Western Summer Market at Western Merchandise Mart in San Francisco are July 20-24. | Show time

Names in the news--Olympic Television has acquired Electrona Corp., which was its parent firm. . . J. N. Ceazan Co. is building a new $300,000 building in Los Angeles. . . Kenneth J. Dahm has been appointed manufacturer's rep for Eureka Williams Dispos-O-Matic garbage disposer and Broilking line made by International Appliance Corp. in Denver. . . Kierulff & Co. in San Diego will distribute the Thor line of products for San Diego and Imperial Counties. . . Harry Arnesberg Co. in Seattle will distribute the Universal Major appliance line where he also handles the Stromberg-Carlson line. | Names

Youngstown Kitchens has appointed two new distributors in the West--Crouch Appliance Co. in Phoenix, Ariz., with a branch in Tucson, and Alcock, Downing & Wright Ltd. at Vancouver, B. C. . . Charles W. Ricketts has been made sales manager for N. C. Teakle Co. Inc., northern California distributors of Pacific Mercury TV. Richetts was formerly with W. J. Lancaster. . . Three top men of Harper-Meggee Inc., Seattle, have gone into business for themselves. They are E. Stewart Carter, who was president and general manager since 1948; B. C. McIlroy, general sales manager; W. R. Johnson, operating manager. This led to appointment of J. E. Gollihur, former general manager in Portland, as executive vice-president and gm in charge of Seattle, Portland and Spokane. | and changes

J. T. Dalton, district manager for Zenith Radio in Chicago, has been made regional manager for Los Angeles, San Diego, Phoenix and El Paso. . . Treasure State Gas & Electric Co. of Butte has been made distributor for Whirlpool Corp. in that area. . . Servel air conditioning equipment now has a new distributor in Inglewood, Calif., the Supreme Supply Co. . . Harry Kaye, president, Kaye-Halbert Corp., appointed Ed J. Moreau as direct factory representative for Utah, Montana, Idaho, Colorado and Wyoming. He has been distributor in Salt Lake City, will convert to a factory branch operation. | in the West

E. E. Leavy, operations manager of Graybar at Phoenix, a veteran of 20 years service, takes the managership at Salt Lake City's Graybar house, succeeding the late S. B. Cooper. . . James D. Kress has been named one of six regional sales promotion managers for Ironrite, will headquarter in Seattle. He was formerly with B. F. Goodrich Co. . . John G. Lowcher is now district sales manager in Los Angeles of Deepfreeze Appliance. | Managers

William Donovan has been made Norge division sales manager for San Joaquin Valley for Thompson-Holmes Ltd., San Francisco distributor. . . Austin & Son of Denver has been sold to Dahl-Conger. Conger was formerly Austin & Son sales manager. The firm handles Servel, Arvin and Detroit-Jewel. . . Hallicrafters will be distributed in the Los Angeles area by H. M. S. Distributors Inc., formed by William Shaw, former district sales manager of Hallicrafters, Chicago, who joined with Ted Henry of Henry Radio Co. Line was formerly handled by Horn & Cox Inc. . . Kertson & Daniel Distributing Co. has been formed to handle Capehart TV and radio in San Diego and Imperial Counties. Formerly represented by Gold E. Distributing Co. . . When E. L. Harper resigned as sales manager for the Admiral Corp. distributing division in San Diego Carl E. Lance, general sales manager, succeeded him. . . John G. Watts has resigned as Western regional sm of Deepfreeze in Los Angeles. . . James McMahan has resigned as v-p and sm of the white goods department of Gough Industries, Los Angeles. . . William Goldy, president of Gold E Distributors, named Emmanuel Braunstein as sm, formerly with Pacific Mercury TV. | and changes

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Upright Home Freezers

Chest-type Home Freezers

Dehumidifiers and Room Moisture Conditioners

Room Air Conditioners

Flash Defrosting Refrigerators

Dual-Temp Refrigerators

Flex-O-Heat Electric Ranges

THE MONTH IN BRIEF

Calectric Strike Ends; Edison Strike Continues

Local 47 IBEW-AFL, which on March 10 struck both Southern California Edison and California Electric Power companies, on April 2 suddenly and without explanation called off the Calectric strike. No settlement was reached on company-union wage differences (the company already has a union shop). Details of the Edison strike, which involves closed shop and wage disputes, are on p 129.

Hearing Scheduled on Merger

First hearing by a public regulatory agency on proposed merger of Puget Sound Power & Light and Washington Water Power companies will begin May 18 at Olympia, Wash., before the Washington Public Service Commission. The date was announced by Jerome K. Kuykendall, chairman of the commission, whose appointment to the Federal Power Commission has been announced. (See p 148.) His earlier plans for a joint hearing by the state group and FPC were abandoned after PUDs announced their opposition. The FPC will now hold a separate hearing in Washington, D. C., for which date has not been announced. The state commission has retained the New York engineering firm of Ford, Bacon & Davis to make an impartial study on the effect of the proposed merger. Basic terms now approved by directors of both companies, are on p 132.

Bill to Amend Hydroelectric Commission Tabled

Portland General Electric Co.'s bill to amend the Oregon hydroelectric code (EWEST, April, p 134) was tabled by the house committee on state and federal affairs when it became evident that no acceptable bill could be drawn. Opponents of the bill turned down offered compromises. During the legislative debate, PGE appealed to the Oregon Supreme Court from a circuit court ruling upholding the hydroelectric commission's July 1952 denial of a permit for its projected Pelton Dam. The company has FPC approval of the project.

Company Loses Round in Condemnation Suit

Union County (Ore.) PUD's long-drawn-out condemnation suit against California-Pacific Public Utilities Co. continued in U. S. District Court following Judge James A. Fee's ruling against a company objection. California-Pacific had questioned PUD authority to expend district funds for attorneys, engineers and others to prosecute the suit in federal court. The PUD then asked the court to enjoin the power company from attempting to "thwart" the federal tribunal's jurisdiction. The condemnation action, which is almost a decade old, was moved to federal court in October 1949.

Irrigation Plan May Affect Hells Canyon Decision

An alternative of the USBR's plan for irrigation of Idaho's Mountain Home project, which has been presented to Interior Secretary McKay, is expected to strengthen Idaho Power Co.'s case for three low-level dams on the Snake River as against construction of the bureau's projected high-level Hells Canyon Dam. (FPC has before it the company's request for license to build the first of the three dams.) The irrigation plan, drafted by W. Glenn Sloan, co-author of the Pick-Sloan plan for the Missouri Valley development, is claimed to do twice the work of the bureau plan at less than half the per-acre cost. It would irrigate 123,000 acres of desert and drain Boise Valley farm land now threatened by a rising water table. Cost would be $53,000,000, or $430 per acre. The bureau plan would not tackle the Boise Valley problem; would spend $253,000,000 to irrigate 183,000 acres—$1,090 per acre. It originally called for use of power revenues from Hells Canyon Dam to help pay costs. The Mountain Home development has remained unfinished because bureau proposals were too costly to win Congressional approval and only a small part of the 183,000-acre flat is now being irrigated from two small reservoirs. Under the Sloan plan, 110,000 acres of this project and about 13,000 of the Hillcrest project near Boise would be irrigated. It calls for a 23,000-kw power plant near the outlet of a Long Tom diversion tunnel to utilize a 50-ft head and installation of 48,000 kw at the Lucky Peak flood control dam. Together these plants would produce more than enough energy for pumping and sale of surplus power would be used to help repay project costs.

Legislature Turns Down Interim Study

Oregon's legislature rejected Rep. Monroe Sweetland's proposal for an interim-session study of electric rates and policies of private utilities. His bill requiring PUC hearings within 30 days of any emergency surcharge on electric billings and calling for separate accountings of such surcharges for customers' information passed both houses and was signed by the governor. Both bills were filed following furor over steam surcharges resulting from last winter's hydro shortage in the Northwest. The house committee on commerce and utilities on April 14 tabled by a 5-to-4 vote the resolution for a 15-member committee to make the rate and policy study. Indicating the direction such an investigation might have taken, Gus Norwood, executive secretary of the Northwest Public Power Assn., in his testimony before the house committee, detailed a nine-point indictment of the private companies and said those topics should be covered in any study.

Trinity River Project Endorsed By State

The State of California gave its endorsement to the $207,334,000 Trinity River project, following study of a USBR report. However its own report, prepared by State Engineer A. D. Edmonston and backed by Governor Warren, disagrees with the bureau's figures on what should be charged for generating electricity developed by the Trinity power plants and the water supply that would be available. The bureau recommends that the project be integrated with the CVP; the state finds that a separate Trinity River project would be feasible. Story on page 138.

Congratulations to the Winners of the George A. Hughes Awards for 1952

For your achievements in more successfully promoting the use of major electric appliances during 1952, Hotpoint joins the rest of the Electric Industry in offering hearty congratulations.

As a result of your accomplishments, you—during 1952—led America's electric utility companies in bringing greater comfort and convenience to your customers . . . through modern electrical living.

Hotpoint takes pride in giving recognition to these outstanding utility companies and their employees—the winners of the George A. Hughes Award for 1952:

Utility Companies With Over 150,000 Meters

Southern California Edison Co., Los Angeles, Calif.
- **Electric Kitchen Promotion**

Ohio Power Company, Canton, Ohio
- **Electric Range Activity**

Pennsylvania Power & Light Co., Allentown, Pa.
- **Electric Water Heater Activity**

Philadelphia Electric Co., Philadelphia, Pa.
- **Electric Dishwasher Activity**

Appalachian Electric Power Co., Roanoke, Va.
- **Commercial Electric Cooking Activity**

Utility Companies With Under 150,000 Meters

Minnesota Power & Light Co., Minneapolis, Minn.
- **Electric Range Activity**

Central Ohio Light & Power Co., Findlay, Ohio
- **Electric Water Heater Activity**

Kentucky & West Virginia Power Inc., Ashland, Ky.
- **Commerical Electric Cooking Activity**

Plan now to enter the 1953 Competitions.
Watch for details—to be announced soon.

Hotpoint Co.

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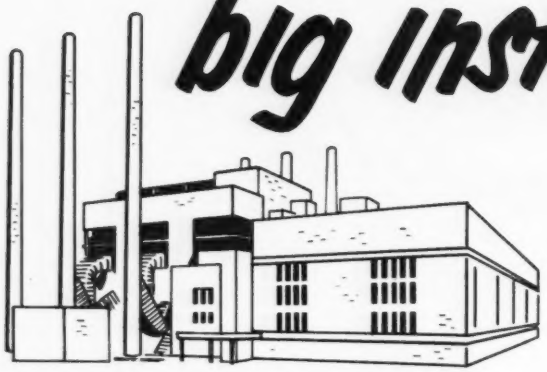
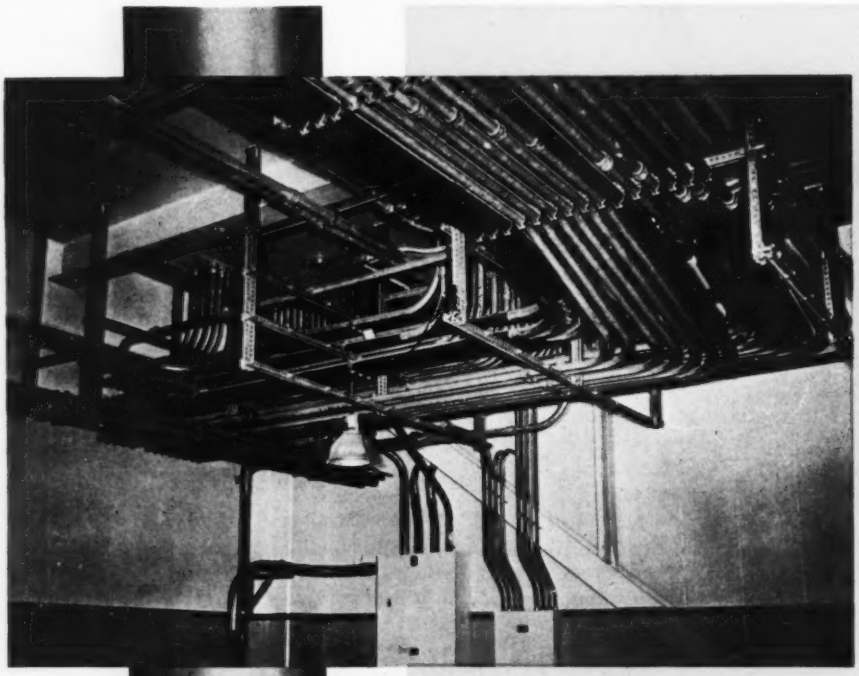
Another big installation of



Miles of Rome • EMT protect wires and cables in PG&E's new Contra Costa steam plant.



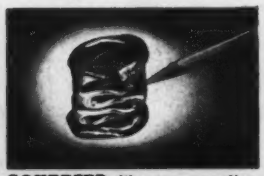
Easy to work and bend, Rome • EMT can be quickly adapted to any plant layout.

Warehouse stocks located as follows:

San Francisco, Calif.	Los Angeles, Calif.
Chicago, Ill.	Salt Lake City, Utah
Dallas, Texas	Seattle, Wash.
Denver, Colo.	St. Paul, Minn.

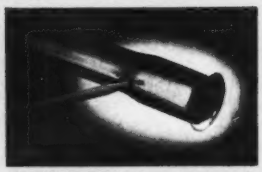
Torrance, Calif.

Rome • EMT is available now in the following sizes: STRAIGHT LENGTHS—½", ¾", 1", 1¼", 1½" and 2". 90° ELBOWS—¾", 1", 1¼", 1½" and 2".

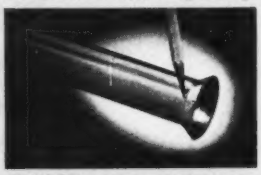


SQUEEZED like an accordion by tons of pressure—yet the Rome • EMT weld holds firm proving the weld to be as strong as the tube wall itself.

FLATTENED like a pancake—actually creased along the weld. But look at the weld itself. It remains unbroken and as good as ever.



EXPANDED 25% and flared. If weld weakness existed, this test would surely find it. Yet look at it—strong as ever . . . proof positive of Rome • EMT's superiority.



FLARED while cold during a cone test. And note the weld. There's not a single indication of a break.

Rome • EMT

at Contra Costa Steam Plant

Superior Electrical Metallic Tubing affords positive protection for wire and cable in new steam plant

Pacific Gas and Electric Company used Rome•EMT for protecting miles of wire and cable in three units of its new $80,000,000 steam generating plant at Antioch, California.

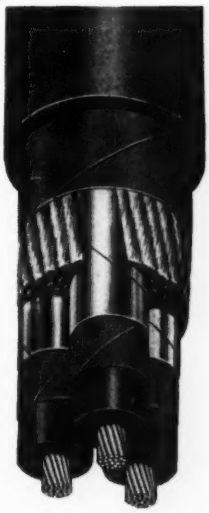
MAXIMUM CORROSION AND ABRASION RESISTANCE

This lightweight electrical metallic tubing is used by leading electrical utilities, contractors and wholesalers throughout the West. It's tops in quality, inside and out. The electrically galvanized exterior surface with its uniform zinc coating assures utmost resistance to corrosion and abrasion. A mirror-smooth interior surface eliminates burrs and rough edges—makes it easy to fish and pull wires. Tough, precision welds stand up under the severest of breakdown tests (see photos). Diameters and wall thicknesses are made to precise tolerances. Approved by Underwriters' Laboratories, Inc., Rome•EMT exceeds *all* standards for thin wall raceways.

LOW INSTALLATION COSTS

And with Rome•EMT you're sure to keep installation costs at a minimum. Its light weight makes it easy to handle and bend. Simple compression type fittings assure snug, tight connections without time-consuming threading.

Whenever your requirements call for thin wall raceway, it will pay you to specify Rome•EMT. And, to assure dependable power distribution, always specify the superior quality of Rome wires and cables. Your nearest Rome Cable office will be glad to help you in planning your requirements.



Miles of Rome RoZone® for Contra Costa

In addition to supplying Rome•EMT for this new steam plant of PG&E, Rome's RoZone-RoPrene Power and Control Cables were used. PG&E also used large amounts of RoZone-RoPrene and Control Cables in its Moss Landing plant near Monterey, California.

Approved by the nation's leading utilities and consulting engineers for its well-balanced properties, RoZone merits your confidence for high or low voltage applications where dependable, long service life is paramount. Are you up to date on RoZone? Send for new catalog.

For unexcelled wire and cable performance:

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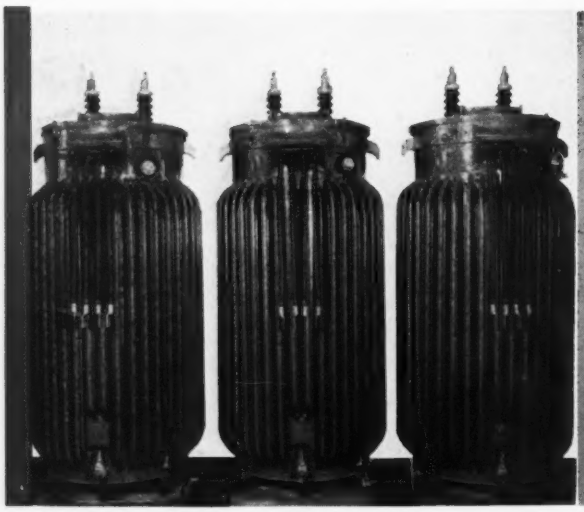

These three GARDNER transformers were installed at the plant of Certain-teed Products Corporation shown above in April of 1937. These 500 KVA, 12,000 volts to 480 volts, single phase transformers have been in operation for 16 years, and according to the manufacturer whose trade name is known everywhere, "Our GARDNER transformers have operated satisfactorily during this time." Certain-teed feels that this plant located in Richmond, California, is one of the most efficient units manufacturing their products.

GARDNER ELECTRIC MANUFACTURING COMPANY

FACTORY AND GENERAL OFFICE

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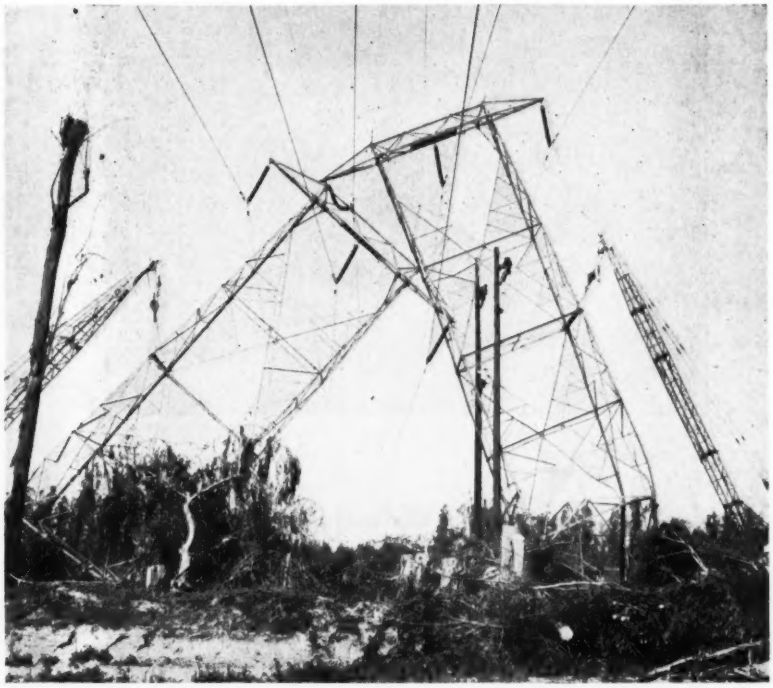
THIS MONTH'S NEWS



Los Angeles Times photo

These Southern California Edison towers near Chino, Calif., are shown after dynamiting. Here crews rig 70-ft poles to support them as the cranes hoist them apart

Strike Against Edison Continues

As the strike of Local 47, IBEW-AFL, against Southern California Edison Co. neared the close of its second month, that company was continuing to maintain full service to its three million customers. This was being done with the help of supervisory and other nonstriking employees and union members who have returned to work. It was being done despite hampering acts of sabotage and in the face of increased load. (In March net load was up 19.2% over the previous year and a record gross peak demand of 1,744,000 kw occurred.)

Called on March 10 to force union shop and wage increase demands, the strike took off the job in the early morning hours some 2,900 out of a bargaining unit of 3,900. Those who stayed at their posts have been joined by others and, after the first month, the company reported that 60% more union members were back on the job than on the first day of the walkout.

There have been no company-union negotiations since the strike began, although both sides have had separate and unfruitful meetings with federal mediators. The union has proposed resumption of bargaining or submission to a fact-finding board. Edison says it cannot negotiate during a wrongful strike but has declared itself prepared to resume negotiations promptly whenever the strike is called off and picket lines are removed.

Declaring that the strike is against a public service agency and as such is unjustified, Edison management has charged that the one controlling motivation is more power for the union's leaders. It has pointed out that it previously had concluded many agreements on an amicable basis with the same union, under different leadership. It has brought to public attention the fact that the strike was called by the union business agent and a small committee in "the middle of the night, without warning which public safety demanded," after four months of "so-called collective bargaining, often stalled by union leaders."

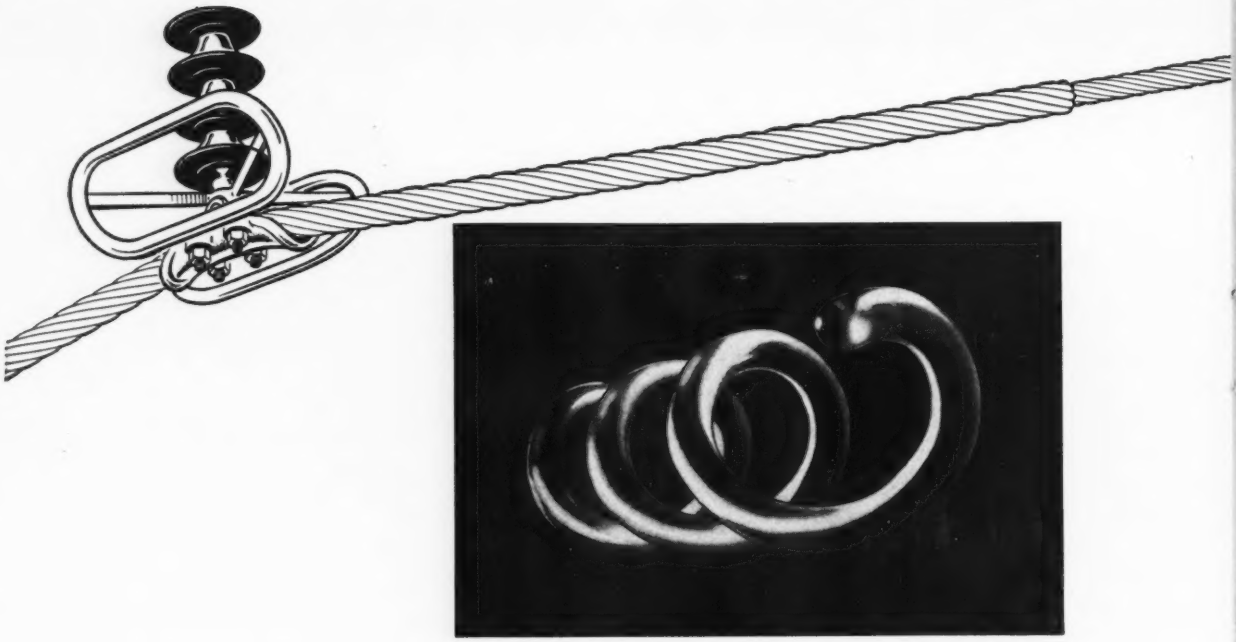
Here are some of the highlights:

Towers Dynamited — In the early days of the strike five 220-kv transmission towers on lines from Big Creek and Hoover Dam were dynamited. Both company and union have offered rewards for information leading to arrest and conviction of those responsible. Union officials have denied all responsibility for property destruction.

Charge Unfair Labor Practices—On April 14 Edison lodged unfair labor practice charges with NLRB against Local 47, stating that the "union has refused to bargain collectively and in good faith unless the company agreed to bargain on matters which it was not obligated to include under its agreement with the union, or under law." The company also accused the union of delaying tactics during the period of negotiation before the strike and of making "effective collective bargaining impossible" through its conduct since March 10. Another charge in the complaint was that the union has infringed on rights of employees in violation of Section 7 of the Taft-Hartley Act.

The union had previously brought charges before NLRB accusing the company of refusal to bargain in good faith and of coercion and interference with employees. It had threatened to invoke the Taft-Hartley Act.

Injunction Studied — At a hearing April 6, Superior Court Judge Frank Swain took under advisement arguments for and against issuance of a preliminary injunction against alleged practices of the union. He continued a previously obtained restraining order until a decision is issued on the injunction. The restraining order, as would the injunction, requires Edison pickets to keep 20 ft apart except when passing, refrain from threatening or intimidating Edison employees, give right-



Preformed Armor Rods are UNIFORM

● All Preformed Armor Rods for a given size of conductor are identical. Every pitch is exactly the same. THIS UNIFORMITY, obtained only by "factory-forming" the rods in precision dies with automatic machines, assures the UNIFORMITY of every Preformed Armor Rod assembly. Such inherent UNIFORMITY is maintained, not deformed, during installation or during operation.

PLP UNIFORMITY assures full efficiency of the armor regardless of the size of the conductor, ease of access to the application point, and the skill of the lineman installing it. With Preformed ARMOR rods, no special tools or wrenches are required. Easily installed by hand or hot-line tools, their field service performance can be predicted accurately.

Because the *gripping* action of Preformed Armor Rods is "built-in", they require no end-clamps; they are engineered to retain their initial intimate contact with the conductor throughout their service life . . . nothing to loosen.

For complete details of their exclusive advantages, write or telephone Cleveland: EXpress 1-3571.

PREFORMED ARMOR RODS:

1—Are "factory-formed" to the individual conductor.
2—Reduce substantially installation time.
3—Increase the effective rigidity of the conductor.
4—Minimize fatigue at suspension clamps . . . lengthen conductor life.
5—Have predictable field service performance.
6—Increase conductance of conductor.
7—Are reusable.

PREFORMED LINE PRODUCTS COMPANY

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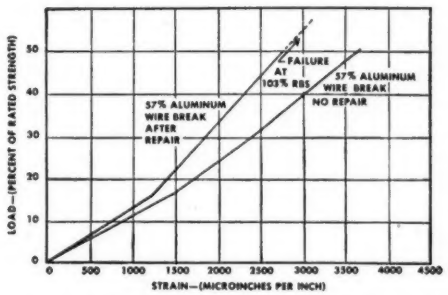
HOW Preformed Armor Rods LENGTHEN CONDUCTOR LIFE

★ The most vulnerable spot of a transmission line is under the suspension clamp. You can get no better armor protection than Preformed Armor Rods. They are always *uniform*—always do the same perfect job—factory engineered and factory formed—no variation in installation. Their intimate contact with the conductor provides the necessary reinforcement without any of the rub or chafe between rods and conductor, which you might expect in a looser installation. Furthermore, they will never loosen. They are not dependent on tightening of bolts which might crush the conductor if improperly applied—and which may become loose.

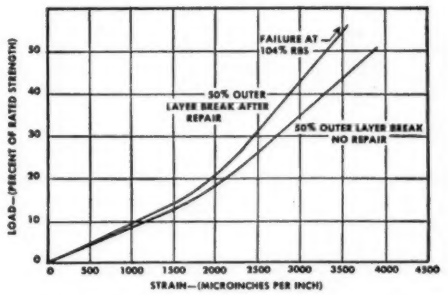
But this is only part of the story: While Preformed Armor Rods will provide the *best* and *safest* protection, they have another *unique* function—they do a job which only Preformed Rods can do. Regardless of armor efficiency, some vibration damage may occur. Should a strand failure occur at the suspension point, Preformed Rods will automatically take on the load, restoring strength and conductance—thereby continuing and lengthening conductor life.*

After all, your interest is in maintaining service—in continued functioning of your transmission lines. You need no longer consider the life of your conductor jeopardized by a strand failure. Preformed engineering has seen to this.

* Many have encountered vibration, chafing and burning failures on unarmored conductors and have used Preformed Armor for repairing and restoration of conductors at those points.



Strength restoration of No. 4, 7 x 1 ACSR (rated breaking strength—2288 lbs.) by Preformed Armor Rods.



Strength restoration of 795 MCM, 26x7 ACSR (rated breaking strength—31,200 lbs.) by Preformed Armor Rods.

These two charts tell the story. Irrespective of conductor size and construction, the clamping characteristics of PREFORMED Armor Rods result in restoration of the strength of damaged conductors to within at least 5 per cent of the rated breaking strength of the original conductors. And remember . . . only with PREFORMED Armor Rods . . . can laboratory tests accurately predict field service performance. There are no "average" installations.

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Strike Developments

Starts on Page 129

of-way to persons and vehicles entering or leaving company premises.

Edison Asks Damages—In addition to asking the injunction, Edison brought suit against the union, asking $1,250,000 in actual and punitive damages, plus $75,000 daily so long as the strike continues. No trial date had been announced as this issue went to press.

Wages Increased—Edison on April 9 increased the wages of employees who are members of the striking union by 5% or $15 a month, whichever is greater, retroactive to Jan. 1, the same increase that was granted to all other employees on March 4 and was rejected by Local 47, which demanded 25c an hour. In announcing the increase, company officials said that so many members of the bargaining unit have either stayed on the job or returned to work that it was only fair to raise their wage scale to that of the other personnel. Employees on strike will receive retroactive payments as soon as possible for work performed from the first of the year to the time they went on strike, it was stated.

Edison's Stand—Edison has protested the strike in telegrams to public officials and has put its case before the public in newspaper ads, on radio and television and press releases.

Edison newspaper ads have invited striking employees back to work; have told its position on union shop and wage issues; have offered rewards for information leading to arrest and conviction of persons trespassing or sabotaging.

Appearing on TV for one-half hour late in March, President W. C. Mullendore thus summarized the "issues and vital basic principles on which the company management has had to take a stand:

"First, there can be no yielding by the company on the principle point for which this strike was called — to give more power to the union leaders by consenting to something which we have no right or power to give—compulsory union membership.

"Second, 'There is no right to strike against the public safety by *anybody, anywhere, anytime.*' That is a statement of plain, fundamental and unrepealable law of right, just as true today as when spoken, with reference to the Boston police strike, by Calvin Coolidge to Samuel Gompers 34 years ago. It is pre-eminently true as applied to a strike designed to destroy and interrupt the capacity to serve of an electric utility upon which the community life, the jobs, the welfare and safety of three million people depend.

"To have used this ugly and dangerous weapon at all against the public safety is wholly wrong and indefensible; but to make impossible demands —demands which no informed person of normal judgment should have thought management had the power or right to meet—and then to pull a strike against the public health, welfare and safety, using violence and threats of great bodily harm in pursuit of those demands, is to go far beyond the limits of right, and even of decency.

"Third, the strike thus wrongfully and irresponsibly called, in pursuit of more power for those who already have too much power, is now the *only* issue. Until it is abandoned, and picket lines withdrawn, there can be no negotiations by the company with Local 47, IBEW-AFL, because the company cannot negotiate under these circumstances free from the influence of a wholly wrongful strike, which is utterly incompatible with, and no part of, legitimate 'collective bargaining.'"

Basic Terms of Puget Power, WWP Merger Approved

Basic terms of the proposed merger of Puget Sound Power & Light and Washington Water Power companies, drawn up by management and approved by directors of both organizations, are:

1. Puget Sound Power & Light Co. . . . will be merged into . . . Washington Water Power Co. . . . by statutory merger. Washington will be the surviving company and its presently outstanding common stock will be unchanged by the merger.

2. The presently outstanding $6 preferred stock of Washington will be called and there will be created by the merger agreement a new issue of Washington convertible cumulative preferred stock, $25 par value, with the following terms: (a) Callable at 27 upon 30 days' notice with right of conversion to the call date. There is no present intention to call all or any part of this preferred stock; (b) convertible for 60 days after the effective date of the merger into Washington common stock, share for share, and for three years thereafter at 27½ (being at the rate of 11 preferred for 10 common), for the next three years at 30 (being at the rate of 6 preferred for 5 common) and thereafter at 32½ (being at the rate of 13 preferred for 10 common); (c) dividends to be payable quarterly at the rate of $1.28 per share per annum.

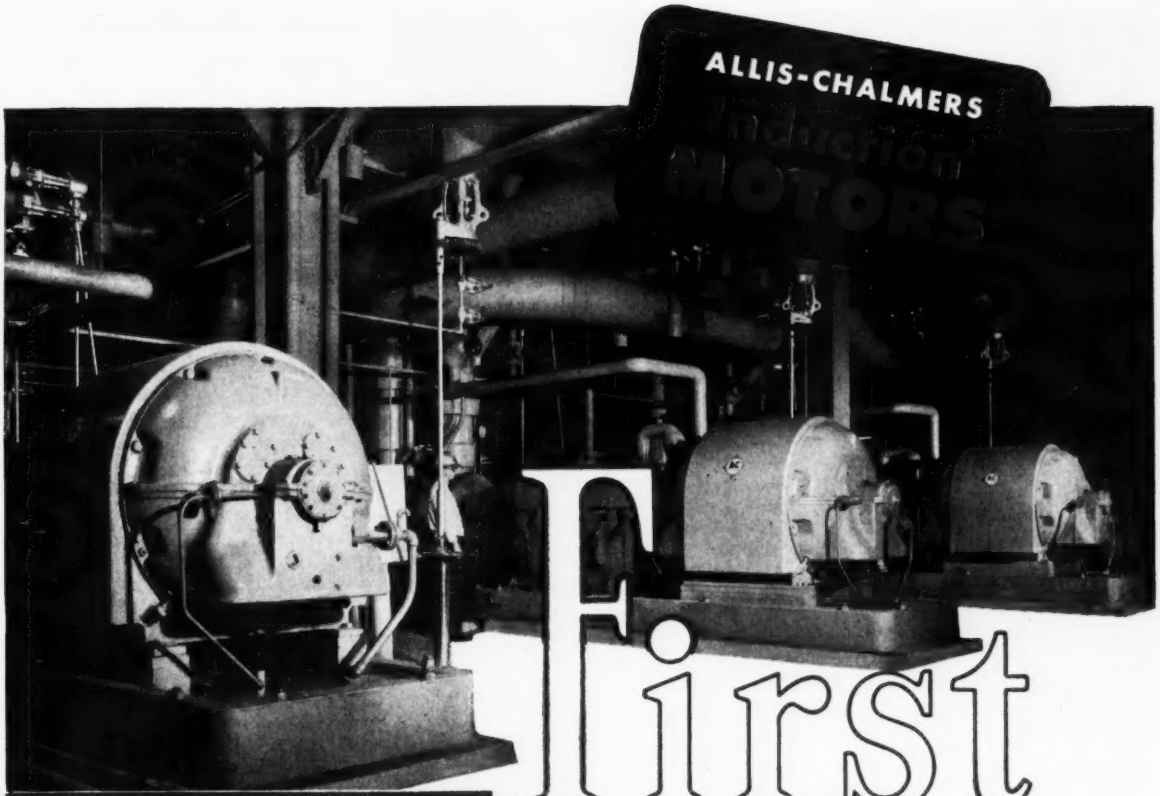
3. Each share of common stock of Puget shall receive one-half share of the new convertible cumulative preferred stock and one-half share of Washington common stock, unless the holder has elected . . . to receive cash instead of stock . . ., in which event he shall receive cash for his shares at the rate of $27 per share.

4. In order to assure a nontaxable status to the transaction, the merger shall not become effective if the total of the stock of Puget electing to take cash plus the Puget stock voting against the merger exceed 50% of the total outstanding common stock of Puget.

5. The merger agreement between the companies shall also provide that Puget's employees who continue in the service of the merged company shall have made available to them and shall be included in the present pension plan for Washington employees on substantially the same basis as provided for Washington employees.

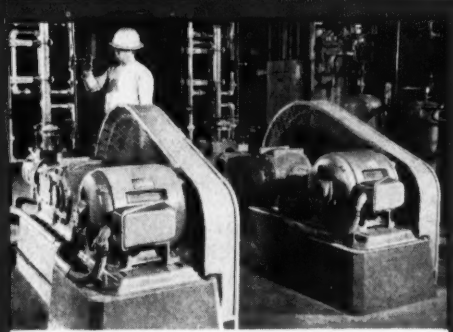
6. Due to the situation of Puget in regard to its purchase agreement with the public utility districts in the State of Washington, the merger agreement between the companies will terminate as of the close of business on July 30, 1953, unless prior to that time the merger has been consummated or the merger agreement has been extended by mutual agreement.

7. An agreement between the companies shall also provide that all employees of Puget on the effective date of the merger shall be retained in their employment by Washington for a period of at least two years at not less than the present base rates of compensation, subject to powers to dismiss for cause, or to be retired subject to the provisions of the pension plan, or to transfer employees from one position or location to another, or to change the title or designation of such employment. (The term "employees" does not include three executive officers, or directors, independent engineers, independent accountants and legal counsel.) Employees of Puget who have been retired prior to the effective date of the merger will continue to receive from Washington payments of the same rate that they are on such date receiving from Puget as long as Washington continues to pay its retired employees retirement benefits.



First

OF THREE TRIPLETS



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	15 — 800 hp	51B7693
	60 — 1750 hp	05B7542
Totally-enclosed fan-cooled (End-shield bearing)	½ — 100 hp	51B7225
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	125 — 3000 hp	05B7150
Two-pole — 900 hp and larger		05B7550
Large vertical		05B7629
Large pedestal-bearing		05B7771
Totally-enclosed water-cooled		05B7682
Weather-protected, for outdoor use		05R7874

These three 1500-hp, 3580-rpm boiler feed pump motors are the first of three such sets due for installation at Cincinnati Gas & Electric's Walter C. Beckjord station.

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HOUSE APPROPRIATIONS GROUP DECLARES POLICY

Bonneville Power Administration budget cuts by the house appropriations committee and accompanying "policy declaration" for federal power activities gave hope in the Northwest for a more favorable climate for private operations.

However, both private and public power spokesmen were quoted as saying that if all contemplated cutbacks in BPA and Army Engineers' projects were put through, they might prove costly to the region's development unless adjustments are made in subsequent years.

The policy declaration, made April 23, was: "In all future projects or new starts, which include transmission lines, private enterprise shall be urged to take the initiative in constructing, owning and operating such works before money is made available for federal construction."

Referring to long-range projects already underway, the congressmen recommended private enterprise should be taken into partnership to build, own and operate that part of each project that can be handled by private ownership under conditions that protect the interest of all the people.

The committee cut $16,900,000 in BPA construction, 37% of fiscal plans proposed in the initial request. The total cut was $19,300,000 from the Truman budget of $62,600,000. The other cuts involved items that generally were covered in the committee's critical comment on BPA operation and maintenance staff, prompting references to BPA overhead amounting to $16,200 a year for each of the various private and public customers and industries.

Specifically the congressional committee recommended dropping some 12 items entirely. These include:

Snohomish-Kitsap extension of 230-kv transmission grid to Olympia peninsula to ease overloads in Olympia-Shelton - Bremerton. The $2,605,000 cut was for land acquisition, clearing and contracts to bring this line into operation by November 1954.

Transformer additions to ease Walla Walla - Pendleton overloads, winter 1954-55.

Land purchase and design for 115-kv line extension to meet load growth in Grays Harbor district by 1956.

Installation of available 115/69-kv transformer in Aberdeen, Wash., substation to supply REA-financed Quinault Light Co. by 1955.

Construction of 12 miles of 115-kv line from Naselle, Wash., sub to Ilwaco-Long Beach, Wash., to serve

new loads on Pacific County PUD system and to be energized by June 1956.

Service points at Warden, Wash., sub to supply requests of USBR's irrigation project pumps and Washington Water Power Co.

Design and materials on substation to serve Ferry and Stevens PUDs, which had been deferred from earlier dates.

Minor materials needed to complete substation at Newport in Idaho panhandle to be energized by October 1954 to serve Pend Oreille PUD and Co-op.

Columbia Falls, Mont., sub, a project evolved from BPA and Mountain States Power Co. studies indicating that the most economical method of serving load growths would be for BPA to build a station on the Hungry Horse-Kalispell 115-kv line. A terminal position would serve Mountain States.

Power Facilities Asked for Flood Control Projects

Oregon Rep. Harris Ellsworth has asked Congress to include in the Corps of Engineers civil works program authorization for power facilities at three Willamette Basin dams now listed as flood control projects. The southern Oregon representative said the hydroelectric facilities would add 121,000 kw to capacity.

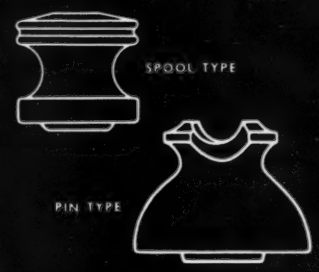
The projects are the Cougar reservoir on the south fork of the McKenzie River, which could produce 25,000 kw; Green Peter, on the Santiam River, with 81,000 kw potential, and White Bridge, a reregulating dam for Green Peter, which could add 15,000 kw.

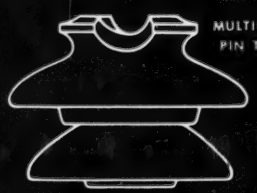
Cougar Dam is authorized as an earth and gravel - fill - type structure. Usable flood storage is figured at 182,000 acre-ft with some 27,000 acre-ft required for energy production. Green Peter, planned as rock-fill-embankment type with central impervious earth core, would store 322,000 acre-ft, of which 52,000 acre-ft would be allocated to power.

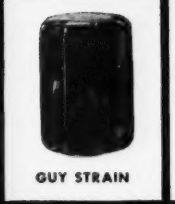
● **Seattle City Council** has been asked by E. R. Hoffman, City Light superintendent, to approve a 20-year power - purchase contract with the Bonneville Power Administration. The new contract, proposed to go into effect Oct. 31, would replace a 10-year agreement which still has more than four years to go.

● **California Electric Power** Co. has received FPC authorization for issuance of $8,000,000 in first mortgage bonds.

APPROVED FOR R.E.A. USE







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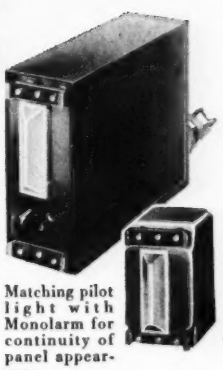

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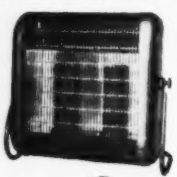

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POWER MEN, BPA DISCUSS LONG-TERM CONTRACTS

Outlook for 20-year contracts for firm power from dams now under construction was discussed at a meeting between officials of eight Northwest power companies and Bonneville Power Administration. Six of the companies now have five-year contracts that can be extended before expiration.

Prime power supplies available to BPA will rise from the present level of about 1,750,000 kw to 3,698,000 kw in the winter of 1960-61, if construction schedules at McNary, Chief Joseph, The Dalles and Willamette Valley projects are maintained.

Companies represented at the meeting were Portland General Electric; Washington Water Power; Mountain States Power; Montana Power; Pacific Power & Light; Puget Sound Power & Light; California Pacific Utilities; California Oregon Power.

Engineers Tell Plans for Rocky Reach Dam Project

The proposed Rocky Reach Dam on the Columbia River near Wenatchee, Wash., may be built as early as 1965, Col. E. C. Itschner, North Pacific division engineer for the Corps of Engineers, declared recently.

The dam has not yet been authorized and will not be undertaken until greater upstream storage is provided by such dams as the Libby project in Montana, Colonel Itschner declared. Tentative plans call for a dam 3,100 ft long with an 1,192-ft spillway.

Costing some $325,000,000, the dam's nine generators would produce 446,000 kw nominal prime power, with provision to be made for five additional units raising power production to 910,000 kw installed capacity. The prime power would cost $29 per kw, as compared to $17 for McNary, $12 for Chief Joseph, $17 for The Dalles, $19 for Ice Harbor and $15 for Priest Rapids.

● **Aluminum Co. of America** appears to be low bidder at $4,078,784 FOB bidders' shipping point at Vancouver, Wash., for 17,000,000 lb of steel-reinforced aluminum conductor cables which will form the backbone of a new ultra-high voltage transmission line for Bonneville Power Administration in the Pacific Northwest. The 1.6 in. diameter conductor, for a 345 v line program involving 1,358 miles of circuit, represented the largest single-bid project for cable in the agency's history.

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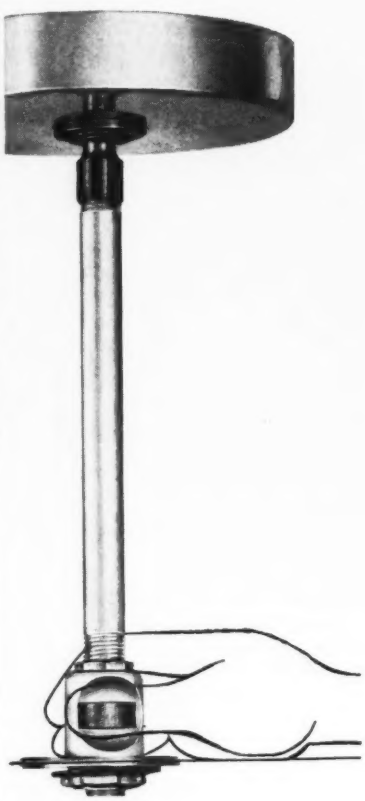

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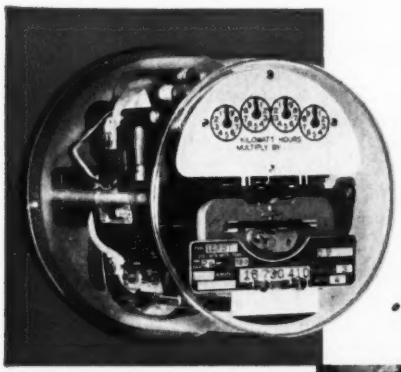

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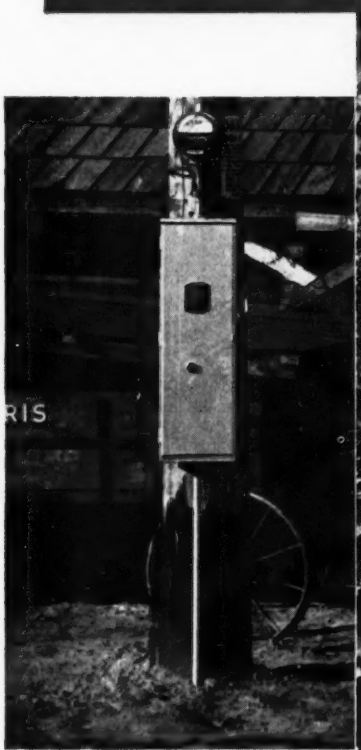

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CALIFORNIA MAKES REPORT ON TRINITY RIVER PROJECT

Integration of Trinity River project in California with the Central Valley project could financially aid the latter if proper and adequate rates for water and electric power made available by the Trinity works were established, according to a report of State Engineer A. D. Edmonston. USBR has recommended integration of the two. The state report finds that a separate Trinity River project would be feasible.

To aid financially a rate for the electric power substantially higher than that given in USBR financial analyses would be required, the state believes.

An amount of 1,616,700,000 kwh is given by the bureau as the average annual net power output attributable to the Trinity project, including a steam plant. Deducting for transmission losses, the average annual net power output given in the bureau report as available for sale becomes 1,511,000,000 kwh.

To provide for payment of the $8,586,700 of annual cost chargeable to power features, the state points out, would require sale of the electric energy at a price of 5.7 mills per kwh, as compared to the sale price of less than 5.1 mills per kwh, on the average, proposed in the bureau report, and about 4.4 mills per kwh provided for in some of the recent contracts entered into by the reclamation service for CVP power.

In order to make the power revenues pay at least the annual cost on the power features, the state study contends, it would be necessary to sell the entire electric energy output at 5.7 mills per kwh. If only 38% of the capital cost of the steam-electric plant were allocated to the Trinity project, a higher rate than 5.7 mills per kwh would be required.

Unless the energy were sold at a rate higher than that required for payment of annual charges on the power features, the revenue from power sales could not financially aid the irrigation features of the CVP if the operations of Trinity and Central Valley projects were integrated, the report continues.

If no financial aid to the irrigation features of the Trinity project would be available from the power features, water would have to be sold at a rate adequate to pay the entire annual cost of the irrigation features, the state report points out. This would amount to about $2,306,000, it states, and on this basis the cost of the 515,000 acre-ft annually of new water available for irrigation would be about $4.50 per acre ft.

According to Edmonston, if the same amount of water were sold at $2.50 per acre-ft, the irrigation deficit would be $1,018,500 annually and if this deficit were paid from power revenues the electric energy would have to be sold at 6.4 mills per kwh. To sell the water at a price af $1 per acre-ft, it would be necessary to obtain 6.9 mills per kwh for the electric energy, he states.

The state report concludes there would be a market for the output of the Trinity River plants by the time they could be brought into production, and that this would be true even though all the hydro plants that appear possible of completion by 1960 were constructed on schedule.

USBR in its allocation of project costs to each use lists $122,868,000 for power; $82,467,000 for irrigation; $369,000 for municipal and industrial use; $1,588,000 for future use and $42,000 for fish and wildlife.

Power Companies Granted Increased Pumping Rates

Increases in irrigation and soil drainage pumping rates ranging from 3 to 10% were granted to Idaho Power Co. and Utah Power & Light Co. by the Idaho Public Utilities Commission.

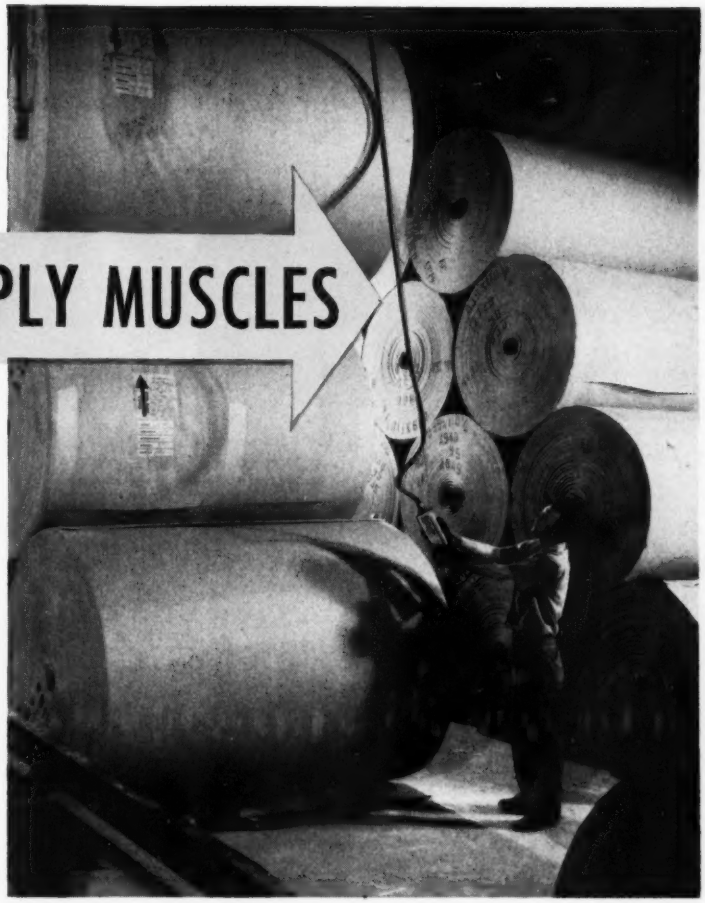
The UPL rates, granting an average increase of about 9½%, were effective April 1. The Idaho Power rates, averaging about 8½%, became effective April 15. Based on average net investment plus working capital estimates for 1953, the new rates would permit a possible rate of return for UPL of 6.19%, and for Idaho Power of 5.28%.

Replying to water user and farm groups protesting the proposed increases, the commission stated it "cannot prescribe rates for public utilities based upon variations of farm commodity prices." The protestants had opposed the increases on grounds that their ability to pay higher rates was curtailed by declining farm prices.

The proposed increases would give Idaho Power a gross revenue increase of $102,200 this year. Utah Power would get only $17,831 more.

Higher brackets in the new schedules were applied to larger units with high monthly load factors. The commission said Idaho's irrigation pumping load has now reached the point where it is creating its own seasonal peak, and this peak comes at a time when the flow of the Snake River is at its lowest seasonal level.

HOW TO MULTIPLY MUSCLES



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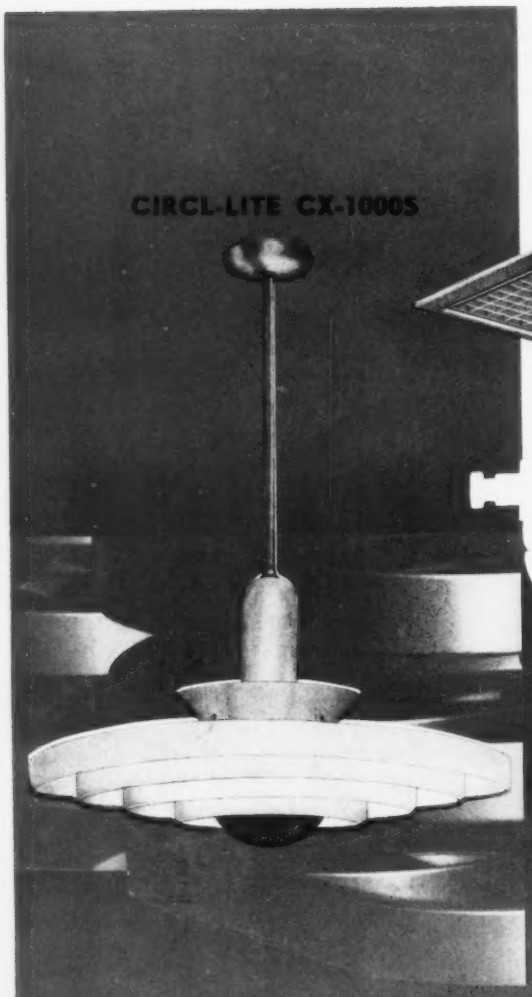

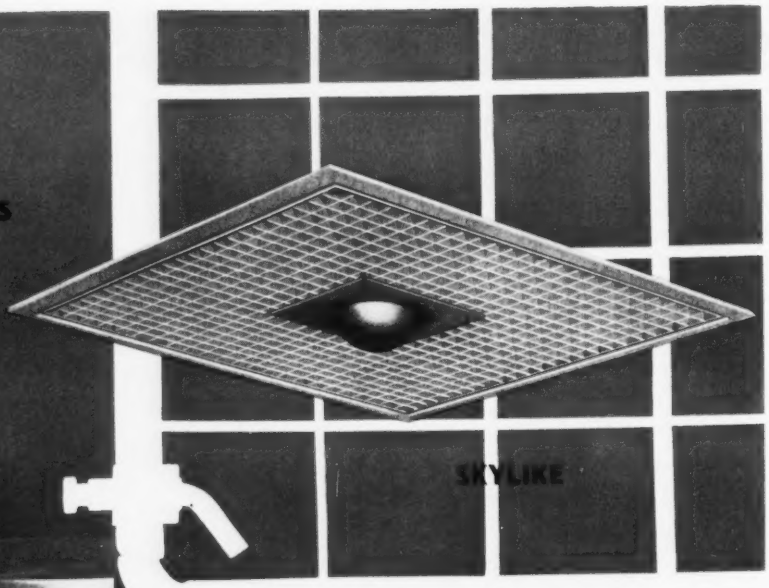

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INCREASED HEAD APPROVED FOR CHIEF JOSEPH DAM

Head at Chief Joseph Dam will be increased 8½ ft, with a consequent increase in hydroelectric power capabilities, as the result of nominal structural modifications approved by the Corps of Engineers.

These modifications will increase the height of the spillway gates from the top elevation of 940 ft to 946 ft, according to Col. N. A. Matthias, Seattle district engineer. No delay is expected in keeping the scheduled date of Sept. 1, 1955, for placing the first three generating units on the line.

The approved change in pool elevation will decrease the Grand Coulee head to some extent, depending upon the Coulee discharge. Under existing conditions, a net gain in continuous power of 12,900 kw will be realized, the increase of 33,400 kw at Chief "Joe" being offset somewhat by a reduction of 20,500 kw at Grand Coulee.

Gains would begin to materialize after the seventh generating unit goes on the line in 1956.

Bids were due May 6 for the manufacture of main turbines for six more power generating units, to complete the initial installation group of 16. Ten main turbines already are under contract. Awards are pending for the second group of four main generators bid at $4,406,000 and for main transformers for 12 power units, bid at $1,859,000. The 16 generating units will have a rated capacity of 1,024,000 kw.

PUD Revises Plans; Will Try for Two Low Dams

The Atomic Energy Commission probably would not oppose the plans of the Grant County PUD to build two low dams across the Columbia River at Priest Rapids not far from the commission's Hanford Works at Richland, Wash., says David F. Shaw, works manager. It earlier had expressed concern over plans for a high dam at the rapids, fearing that destruction of the dam in an atomic attack would wipe out the works. As a result, the PUD has revised its proposal to call for two dams about 15 miles apart.

Glenn Smothers, manager of the PUD, now is asking Congress to revoke authorization given the Corps of Engineers for a multiple-purpose dam at Priest Rapids. He estimates cost of the PUD dams at $358,000,000 compared to $412,000,000 for a single high dam, with completion in about four years as compared to the seven required for a high dam. Power output would be about the same under either plan, Smothers believes, around 1,000,000 kw.

The Cities of Seattle and Tacoma are reported to be interested in the Priest Rapids project, in cooperation with the PUD.

McNary Dam Spills Water For First Time in April

McNary Dam on the Columbia River spilled water for the first time April 24. Two days later the reservoir had boomed up to the interim 310-ft level. Corps of Engineers reported the pool raising was ahead of schedule by as much as 24 hours.

As the water inundated famed landmarks, including historic Fort Walla Walla at the confluence of the Walla Walla River and the Columbia, Sunday spectators along the river were forced to step lively. The stream surged up 4.5 ft within a few hours prior to 5:48 a.m. Sunday when it hit 310 ft and spread out over low lying tracts.

The pool will be raised to 340 ft operating level in November, a month before the first two 70,000-kw generators are scheduled for initial energy production.

Engineers Call Bids for Albeni Falls Power House

Bids for installation of equipment and completion of the Albeni Falls power house in northern Idaho have been called by the Corps of Engineers, for opening June 17 at Seattle.

The contract calls for installation of nonembedded parts of turbines and governors, embedded generator parts, installation of draft-tube gantry cranes, trash-raking equipment, main transformers, switchgear, main control boards and other equipment.

Schedules call for operation of the first 14,200-kw generating unit by July 1 next year, with the third and final unit to be ready by Nov. 1, 1954. The power house now is being constructed under an $8,600,000 contract held by Albeni Constructors. The turbine contract is held by Baldwin-Lima-Hamilton Corp. while the generators will be supplied by General Electric.

● **Lower Valley Power & Light** Inc., Freedom, Wyo., cooperative, has applied to FPC for authority to acquire all the electric facilities and properties of Star Valley Power & Light Co. of Afton, Wyo.

ROCK ISLAND ADDITION NEARING COMPLETION

Last of six additional 27,500-kw generators is scheduled to go into operation at Puget Sound Power & Light Co.'s Rock Island Dam across the Columbia River near Wenatchee, Wash., by June 1, increasing the project's capacity to 245,000 kw. The first new generator went into operation Sept. 13 and the fifth March 14.

The expansion program was financed by the Chelan County PUD, through agreement with Puget Power. The PUD has contracted to furnish 120,000 kw of firm power through June 30, 1955, to Alcoa's nearby aluminum reduction plant, with reduced amounts provided for delivery thereafter until contract expiration on July 1, 1957. Puget takes such dump energy from the PUD as it can beneficially use, until July 1, 1955.

Further Study Ordered on Loans to State Agencies

Further study was ordered by a California legislative committee of a plan for a billion dollar state bond issue to finance loans to local governmental agencies for water and power project construction.

Senator George J. Hatfield (R) of Merced County expressed the opinion the people of California would not vote a billion dollar bond issue until the program was well investigated and endorsed by the legislature.

He suggested, and the senate committee on water resources voted agreement, to have the plan investigated by the joint legislative committee on water problems between now and the 1955 legislative session.

● **Baker,** Ore., voters approved a $100,000 bond issue for new street lights by a scant six-vote margin in an election that swamped a companion $200,000 serial tax levy for street construction. Count on the street light bonds was 858 yes, 852 no.

● **PG and E's** total tax bill for 1952 amounted to $78,985,614, an average of $216,000 for each day of the year and of $49 for each business, farm and residence served by the company.

● **Hawaiian Electric Co.'s** annual report for 1952 shows its net income up $24,000 to $1,599,054, but still $288,000 below its postwar high in 1950. HECo paid a dividend for the 52nd consecutive year, the returns totaling $2 a share.

NEW E. M. T. SET SCREW FITTINGS SAVE INSTALLATION TIME ...GIVE LASTING GRIP

These new EFCOR Set Screw Connectors and Couplings make possible amazing labor and material cost savings in non water-tight installations. One turn of set screw locks the E.M.T. firmly into place.

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CITY HIRES EXPERT IN FRANCHISE CASE

In an attempt to increase revenue from utility rights-of-way, the city of Phoenix has retained Dr. John Bauer of New York to assist in negotiations with Arizona Public Service Co. over a new 25-year franchise to operate within the city.

The franchise, to replace the present one that expires in December, would provide for greatly increased returns. At present the city will receive a total of $2,065 for the fiscal year, based on 2c for each $100 of gross earnings, city officials claim.

Agreements reached during the past year with smaller cities served by Arizona Public Service provide for payment to the municipalities of 2% of gross income. In early talks, Phoenix officials indicated they wanted 3%.

Dr. Bauer heads the American Public Utilities Bureau of New York, which assists government agencies and other groups by providing technical help in drafting rate and tax work.

Oregon Town Passes First Franchise Tax Ordinance

Ontario, Ore., city council passed a franchise tax ordinance April 20, placing a 2% tax on Idaho Power Co.'s gross revenue. This is the first municipal franchise levy on the company and becomes effective with a 10-year franchise renewal in June. It probably will cost the company some $6,500 annually. Idaho Power already is paying out $6,101,882 in federal, state and local taxes from 1952 revenues of $19,132,423.

Colorado Adopts New Law For Engineering Exams

New engineer examining legislation to replace a 1951 law ruled unconstitutional early this year was adopted by the Colorado legislature. Supported by engineering societies of Colorado, the measure establishes exact examination subjects and does not grant any power of discretion to the State Board of Engineer Examiners.

The Colorado Supreme Court ruled that the 1951 law granted legislative powers to the board and also that it illegally set up classifications of engineers. There is no classification in the new law.

● **The College of Engineering** at the University of Colorado will conduct an intensive training course in statistical quantity control, June 16-26.

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IN THE FIELD as in laboratory tests . . . *Crapo* Galvanized Steel Strand proves itself capable of withstanding severe punishment. Steel's inherent strength and durability are combined with definite economies in every size and grade of *Crapo* Steel Strand. You'll find the heavy, ductile, tightly-bonded zinc coatings, applied by the famous *Crapo* Galvanizing Process, provide lasting protection against corrosion.

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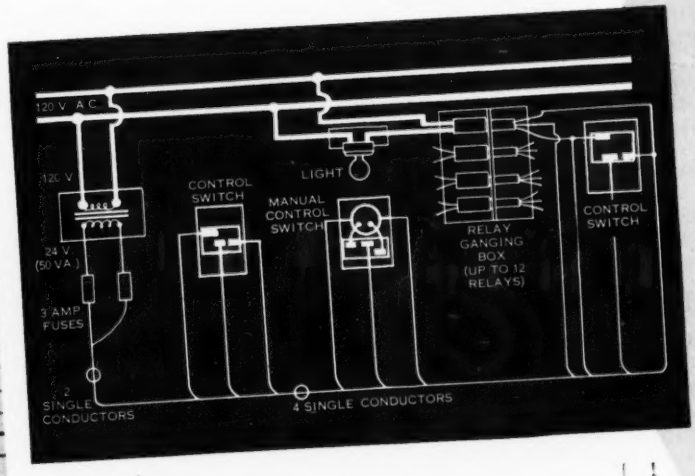
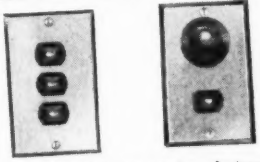


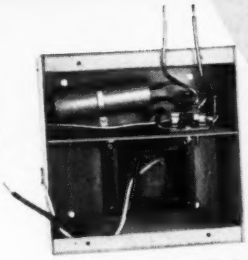
Here is a low voltage remote control system with all the features you've wanted . . .

Because it saves so much installation time, the cost of this very flexible system compares favorably with conventional systems. Actually less, in many cases. It offers a super-convenient means of switching lighting and appliance circuits. It has scores of applications—in homes, office buildings, schools, churches, warehouses, factories.

Relays are extremely rugged. 20 amperes, 120 volts A.C. Also 20 amperes, 277 volts A.C. for low voltage control of high voltage fluorescent lighting. All relays mount in ½" knockouts.



Control Switches are toggle type and fit Despard plates and straps. One, two, or three control switches (*left, above*) or one **Manual Selector Switch** and one control switch (*right, above*) can be mounted on a single strap. Manual selector switch controls from 1 to 9 circuits. Key-operated switch also available.



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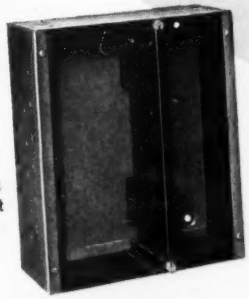

Master Controller automatically controls up to 23 individual circuits from any location.

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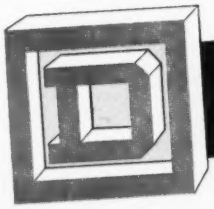

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Yes, quickly make bends *exactly* as you want them, when you want them, where you want them. Compact, portable GREENLEE Hydraulic Pipe and Conduit Bender lets you do this in a jiffy. *One-man operated* to produce smooth, accurate bends in just a few minutes . . . in pipe up to 5", rigid and thin-wall conduit, tubing, busbars. Owners report time savings up to 60% or more, elimination of cost for manufactured bends and fittings, and "clean", tailor-made installations every time. Get facts now on this time-saving tool that often pays for itself on first few jobs! Write for free Bender Booklet, Greenlee Tool Co., 1765 Columbia Ave., Rockford, Illinois.

TOOLS FOR CRAFTSMEN

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Other GREENLEE timesaving tools for electrical work: Hand Benders; Joist Borers; Cable Pullers; Knockout Tools; Auger Bits and Drills.

HOME LIGHTING WORKSHOP OFFERED IN THE WEST

Said to be the first complete course in home lighting to be offered on the West Coast, a Home Lighting Workshop will be sponsored June 15-19 in San Francisco by the San Francisco State College, IES, Northern California Section, and Northern California Electrical Bureau. Experts in the field will conduct the meetings, which will be held in the Pacific Gas and Electric Co. auditorium.

The college has approved the course for one unit of upper division credit. Those wanting credit will pay a nominal fee; others will not be charged.

The course is designed to meet interests and needs of many different groups, including teachers, consultants, designers. Among the speakers will be Myrtle Fahsbender, director of residential lighting, Westinghouse Lamp Division, Bloomfield, N. J., and Kaye Leighton, residence lighting specialist with General Electric Lamp Division, Nela Park, Cleveland.

Utility Offers Apprentice Training in Ten Trades

Hawaiian Electric Co. is training 25 apprentices in 10 trades to increase its skilled personnel. Nineteen are from within the company and six are new hires. They were selected from 80 applicants through tests by the Territorial Department of Public Instruction, and will take a revised four-year training program, including study at a school set up by the company.

State Supreme Court Rules In Tax Case

General Electric Co. cannot recover more than $1,000,000 in business and occupation taxes it has paid to the State of Washington on work done for the Atomic Energy Commission at Hanford Works, the Washington State Supreme Court has ruled.

The decision reverses a decision of a lower court. General Electric and the federal government maintained the company actually was an agency of the AEC at Hanford and therefore was exempt from state taxes. The court rules, however, that under G-E's contract with the AEC "the incidence or impact of the tax falls only on General Electric as a business corporation and not as an agency or instrumentality of the United States."

General Electric's contract, dating back to 1946, provides that it receive $1 a year with the federal government bearing all operating costs, including the protested state tax.

"The manufacturing of fissionable material (by G-E) is done by it not as an agent or instrumentality of the United States, but as a part of its authorized corporate functions," the opinion declared. "The taxpaying status must be determined by our statutes and not by any status or relationship attempted to be created by contract."

California PUC Grants Residential Rate Boosts

A rate increase amounting to 4.83% for its residential users in northern California has been granted the California Oregon Power Co. by the California Public Utilities Commission.

Annual revenue of the company will be boosted $61,567. If the Oregon commission orders a similar increase, the system-wide revenue will be raised $272,000 annually.

The order, which became effective May 1, affects 13,000 residential customers in five northern California counties—Siskiyou, Modoc, Del Norte, Trinity and part of Shasta.

The utility also was ordered to proceed with a 13-item construction program to improve its service. Major items are reconstruction of existing transmission lines and some new transmission lines.

High Metal Scrap Prices Cause Mounting Thefts

Pilfering of utility equipment is mounting to serious proportions in Arizona as the apparent result of high metal scrap prices.

Latest in thefts was wire used to ground lightning along the main transmission line from Parker Dam to the Arizona Public Service steam plant west of Phoenix.

Two men arrested by sheriff's deputies admitted selling 480 lb of wire cut and gathered between Phoenix and Gila Bend. A second hand dealer paid them $86.40 for the loot.

The wire, up to ¼ in. thick, cost several hundred dollars new—not counting installation cost. Originally buried 18 in. to 3 ft deep, it had been uncovered by desert floods.

● **The Public Utilities Commission** approved a petition by the Maui Electric Co. Ltd. of Honolulu to issue and sell $1,000,000 of series C first mortgage bonds. They will be dated April 1, 1953 and will mature in 25 years with interest at the rate of 4½% per annum.

Here Are Five Devices

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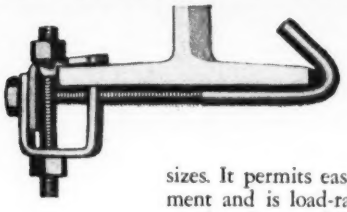
That Help Do Better Jobs-Quicker

In Conduit Installations

No. 160 Adjustable Beam Clamp



A Beam Clamp adjustable to flange thickness, with a long threaded Hook Rod adjustable to a wide range of beam sizes. It permits easy Hanger Rod adjustment and is load-rated 500 pounds with a safety factor of five (5).

No. 177 Adjustable Channel Clamp

This clamp is adjustable to all structural channels with maximum flange width of 3-1/2". It is also adjustable to fit any structural angles with leg up to 3/8" thick. Its load rating is 500 pounds.

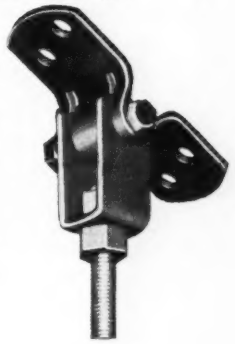
No. 150 Conduit Hanger

Hangers for suspending all sizes of conduit, providing temporary support during installation. The vertical adjustment range is 1-1/2" or more, and when conduit is in place, Hanger Bolt is inserted into slot and nut (which has not been removed) is tightened, locking into position.

No. 165 Adjustable Beam Clamp With Swing Connector

This Beam Clamp is identical with No. 160 with addition of a Swing Connector which eliminates bending of Hanger Rod when suspending from purlins. Swivel Bolt is furnished with patented lock nut which permits free movement, but safely holds bolt in place.

No. 170 Adjustable Swinging Hanger Flange



This flange with four 13/32" holes can be installed with wood screws or 3/8" bolts. With it is furnished Swivel bolt with patented Lock Nut as used No. 165. Hanger Rod Nut locks in position. It is load-rated up to 1200 pounds—depending upon strength of wood screws used.

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of Clamps, Hangers and Supports has been designed from a thorough understanding of their requirements and to enable the electrician to make conduit installations—from the simplest to the most complex—in an easy and low-cost manner, with a neat, workmanlike appearance. Write for any information desired.

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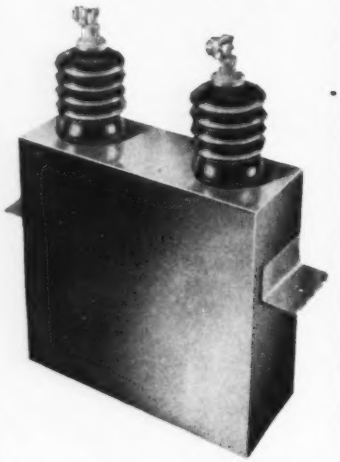

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• Cooler, cleaner lighting plus longer lamp life. That's what you can expect with the new ABOLITE "All-White" lifetime, porcelain enameled fixtures. The ventilating slots provide automatic air circulation, prevent dust from fogging lamp and reflector.

Ask your wholesaler for complete details.

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THE JONES METAL PRODUCTS CO.
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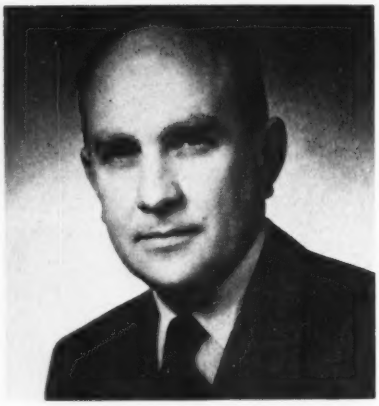
NOTES ON THE TRADE

● **Combination** of Allis-Chalmers district and branch office territories of Denver, Salt Lake City, Phoenix, El Paso and Spokane into the Rocky Mountain region, with headquarters at Denver, has been announced by **C. W. Schweers,** vice-president and director of sales of the General Machinery Division. **Richard D. Moody,** manager of the Los Angeles district office since 1950, has been appointed manager of the new region. Moody joined the Allis-Chalmers graduate training course in 1938 and was connected with the Knoxville and Chattanooga offices before entering military service in 1941. He was discharged from the Army Engineers in 1946 as a lieutenant colonel and assigned to Allis-Chalmers San Francisco office, where he was named manager in July 1947. His successor as manager of the Los Angeles district office is **Richard L. Engel,** who had been representative in that office. Engel has been with the company since 1939.

● **W. B. Baker** & Co. Inc., pioneer electrical contractors of San Francisco, has opened a branch shop in Marin County to handle its expanding electrical construction program in the North Bay area. **Alan Shelton,** superintendent for the company, has appointed **Al Davis** as field manager for the new branch, located at 811 A St., San Rafael.

● **Federal Electric Products** Co. of Newark, N. J., is reorganizing its administrative structure in line with its current expansion, which includes a new plant at Los Angeles. The West Coast Division has been established for geographic reasons and will eventually manufacture several lines of the manufacturer's products.

● **J. E. Kerby** has been named manager of the newly created West Central district of G-E's Trumbull Electric Department. It includes all of Colorado and parts of Wyoming and New Mexico in its seven-state area. Headquarters are in Kansas City.



Moody

DIRECTORY ADDITIONS CORRECTIONS

Where-To-Buy Directory

Switches, Fixture
McGill Mfg. Co.
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Manufacturers' Directory

CORNISH WIRE CO., INC., 50 Church St., New York City—J. M. Fincke Co., 1340 E. Sixth St., Los Angeles 21 and 330 10th St., San Francisco.

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DIAL now is ready, as a kit, to fit any regular model on the job. Simple to change. Saves time — Saves money. Use the best.
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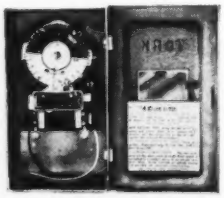

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We at Triangle have an old fashioned idea that what we and our distributors can *give* you—friendship, help, cooperation, is sometimes more important than the wire, cable or conduit we sell you.

That feeling is strengthened every time we get a letter saying, "You and your distributors sure helped us out of a jam" or "We can't help but tell you how much we appreciate your cooperation."

When you constantly get such comments, you know that a lot of people like you are profiting from doing business with Triangle. Perhaps you too will find that things run smoother when you do business with Triangle.

Here are some of the things our field men, in cooperation with a nation-wide network of top electrical distributors, give, every working day—and many a night!

- Expert, friendly counsel on how to get the most and best wire, cable and conduit for your money.
- Expert engineering assistance at any point of the job—and for as long after as you choose.
- An expediting service famed for its helpfulness. We're not supermen, but if it can be done, we'll do it.
- Printed material - calculators, wiring manuals and other literature useful to you many times during the year.
- A spirit of friendliness and helpfulness that will make you feel comfortable when dealing with Triangle.

No matter who you are—contractor, engineer, maintenance man—no matter who you work for—utility, city, contracting firm, large industrial—

YOU'LL LIKE DOING BUSINESS WITH TRIANGLE!

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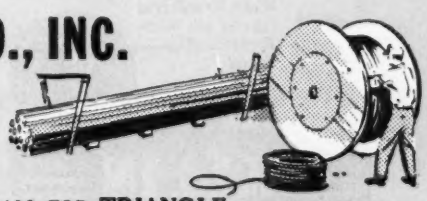
The Trade Mark of Top Quality

TRIANGLE CONDUIT & CABLE CO., INC.

NEW BRUNSWICK, NEW JERSEY

It Must Be Right



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NEWS ABOUT PEOPLE

● **Jerome K. Kuykendall,** chairman of the Washington State PUC, has been appointed to the Federal Power Commission by President Eisenhower. A Republican, Kuykendall is an Olympia lawyer. He was born in Pomeroy and received his law degree at the University of Washington; practiced in Seattle until 1941, when he went to Olympia as an assistant state attorney general. In 1944 he became a lieutenant in the Navy. He returned to the attorney general's office in 1946 and a year later went back to private law practice in Olympia. He was appointed chairman of the state PUC in September 1951.

● **John W. McCaughan** of Spokane has been appointed manager of the box and fittings sales department of National Electric Products Corp., with headquarters in Pittsburgh. He had been working out of the Spokane office of the company since 1950. He is a native of Bremerton, Wash., received his BS degree at University of Southern California and later studied electrical engineering at the University of Washington. He was with Westinghouse Supply in Seattle from 1946 to 1948 and with General Cable Corp. from 1948 to 1950.

● **Expansion** in the electric department has resulted in six major personnel changes in the Public Service Co. of Colorado organization, according to **H. H. Koch,** vice-president in charge of electric operations. **L. R. Patterson,** superintendent of electric system planning, has been promoted to assistant to the vice-president. **R. F. Throne,** former superintendent of steam generating plants, is now chief mechanical engineer. **L. N. Robertson** and **H. A. Burt,** formerly assistant superintendents, hydro production and transmission, have been advanced to chief electrical engineer and superintendent of system operations, respectively. **A. A. Woodward,** former superintendent, steam production, has been made superintendent of production. **W. H. Powell** retains his title of superintendent of electrical distribution but has been assigned additional responsibilities.

● **E. L. Bettannier,** general manager and chief engineer of the Pasadena Municipal Light & Power Department, retired recently following 43 years of service to the community.

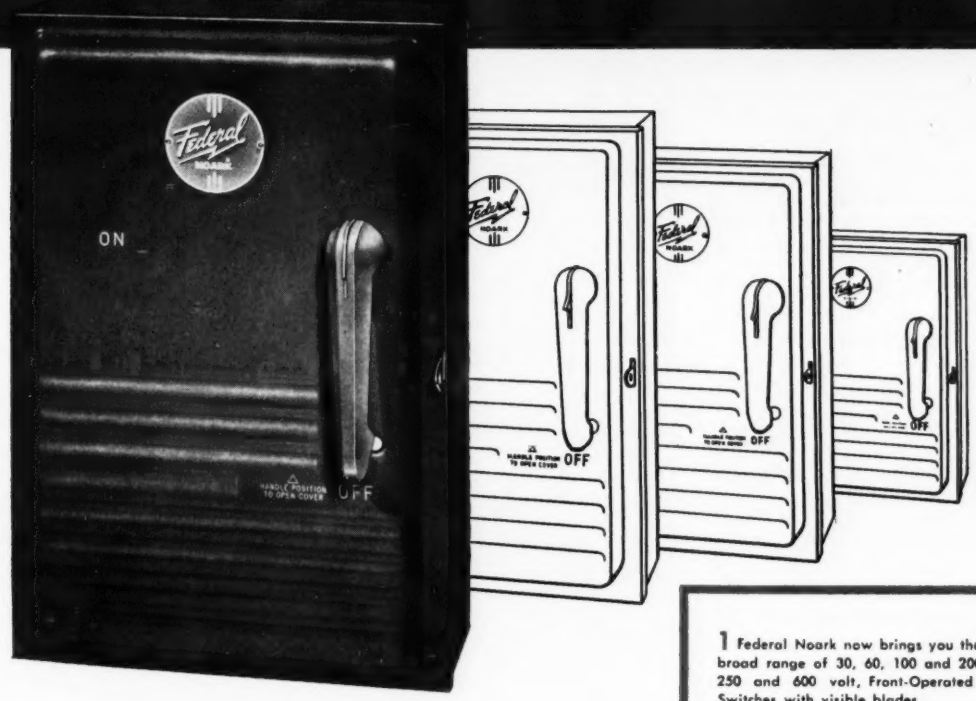
Peterson

Bateman

● **Appointment** of **William S. Peterson** as assistant general manager and chief engineer and of **Ivan L. Bateman** to succeed him as chief electrical engineer has been announced by the Los Angeles Department of Water & Power. Peterson fills the vacancy caused by the recent retirement of **Charles P. Garman.** He has been with the department for more than 30 years and has won recognition as an engineer and designer of major electrical facilities, including the 287,500-v Boulder transmission lines from Hoover Dam, which at the time of construction were the highest voltage transmission lines in the world. During World War II he was power consultant to the War Production Board. Bateman has been with the department more than 25 years of which more than four were as engineer in charge of power operating and maintenance, largest division in the department.

● **Ernie Holland** has been appointed director of sales training in the mainland division of the B. C. Electric.

NOW...200 amp. Front-Operated Industrial Switch joins the NOARK® parade!



HERE'S ANOTHER *FIRST* by Federal Noark . . . the only 200 amp. Front-Operated Industrial Switch with visible blades ever put on the market. What's more, this new switch rounds out the famous Noark Front-Operated Safety Switch line and gives you all the advantages of the 30, 60 and 100 amp., 250 and 600 volt devices.

Front operation means that all these switches can be close-ganged or recessed for maximum space saving . . . the big, man-size handle shows distinctly even across the room whether the switch is "on" or "off".

In addition, these Noark Front-Operated Safety Switches have accommodations for four padlocks . . . and the five special features (described at right) assure coolest, safest operation and longest service life.

Order the new 200 amp. and other Front-Operated Safety Switches from your wholesaler. Federal Electric Products Company, 50 Paris St., Newark 5, N. J.

1 Federal Noark now brings you the whole broad range of 30, 60, 100 and 200 amp., 250 and 600 volt, Front-Operated Safety Switches with visible blades.

2 Pressure spring of the patented fuse holder is located in block under fuse where unaffected by fuse heat. High-pressure lever action provides good contact with minimum contact resistance, assuring cool operation.

3 Only Federal Noark Front-Operated switches have the operating cross bar *beneath* the visible switch blades, forcing all blades open, safeguarding the operator.

4 In this new switch there are only two joints at each pole and both are under extreme pressure. This is the coolest, most practical switch blade construction ever designed.

5 100 and 200 amp. 250-volt devices have arc mufflers . . . all devices over 250 volts have patented Rolarc® Arc Snuffers. Both extinguish arcs instantly and prolong blade life.

Federal Noark products: Stab-lok Circuit Breakers, Motor Controls, Safety Switches, Service Equipment, Industrial Circuit Breakers, Panelboards, Switchboards, Control Centers, Bus Duct ★ Sales offices in principal cities.

FEDERAL NOARK®

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Porter

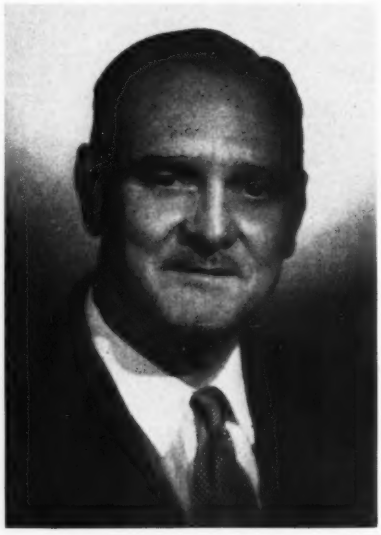
● **William C. Porter** Jr. has been made vice-president in charge of operations for Southern Colorado Power Co. He joined the company in 1926 as an engineer in the office of the vice-president in charge of operations. In 1947 he was made assistant to that vice-president, a post that he held until his recent promotion.

● **The membership council** of the United States Committee on Large Dams, a member group of the International Commission on Large Dams, has announced selection of **E. Robert de Luccia,** vice-president and chief engineer of Pacific Power & Light Co., as a member of the unit. A world-wide technical organization with headquarters in Paris, the commission has national committees in 28 other countries and meets once every six years to discuss design, construction methods and operation of dams. Its next session is scheduled for Paris in the summer of 1955. De Luccia has been a frequent participant in the affairs of other international hydroelectric bodies. He is a member of the World Power Conference, having served as one of three U. S. delegates to the London meeting in 1950. As chief of the Federal Power Commission's bureau of power he attended the 1949 meeting of the International Commission on Large Dams held in Stockholm as U. S. delegate.

● In memory of the late **Lewis A. (Tam) McArthur,** for many years vice-president of Pacific Power & Light Co., a three-mile line of cliffs in the central Oregon Cascades has been named Tam McArthur Rim. The U. S. Board of Geographic Names in Washington, D. C., selected the name in honor of the man who was an authority on Oregon geographic names. The choice was approved by Secretary of the Interior Douglas McKay, who said the "rim" is appropriate to the character of the man, "incisive, conspicuously outstanding and bold without being forbidding."

Miller

● **Southern Colorado Power** Co. has promoted **Robert M. Miller** to the position of vice-president and treasurer. He started with the company on May 20, 1920, as cashier in the Canon City office, was moved to the Pueblo general office in 1923 and was made assistant treasurer in 1925.



Bosworth

● **Harlan P. Bosworth** Jr. has been elected a vice-president of California Oregon Power Co. He will continue to work as assistant to **John C. Boyle,** vice-president and general manager. Bosworth joined Copco in 1923 to work on field surveys for proposed power developments and on design of hydraulic features of the projects. From late 1925 to 1929 he worked in the office of the vice-president and general manager in Medford, Ore., and in September 1929 was appointed manager of the Klamath Falls district. He held this position, with the exception of 3½ years in the Corps of Engineers during World War II, until 1947 when he was transferred back to the Medford office.

Berger

● **Two new appointments** have been announced by Westinghouse Electric Supply Co. **Louis G. Berger,** district manager since 1946, is now Pacific regional manager of consumer products. **William B. Meek,** former district manager with headquarters in Cincinnati, will now serve as district manager of apparatus and supplies. Headquarters for both men will be in Los Angeles.

● **M. G. Lord,** who retired last year as vice-president in charge of operations for Southern Colorado Power Co., died April 15 after a prolonged illness. He had been serving part time until Jan. 1 of this year, when he completed some statistical studies. He started his career as an apprentice at the T. H. Smith Electrical Works in Denver in 1895, then purchased in 1903 an interest in and built an electric lighting plant at Meeker, Colo. In 1907 he joined the Pueblo and Suburban Traction & Lighting Co., which later became a part of Southern Colorado Power.

● **Carl E. Johnson,** one of the founders of Sterling Electric Motors Inc., Los Angeles, died late in March at his home in San Marino, Calif. He was born in Chicago in 1883 and moved to San Francisco in 1903. Two years later he went to Los Angeles and resumed activities in the electrical manufacturing field. In 1906 he organized the first company on the West Coast for the manufacture of electric motors and generators. He was responsible for approximately 55 patents on electric apparatus.

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PROFILES

Dr. Adam S. Bennion, vice-president of Utah Power & Light Co. since 1945 and on the power company staff since 1928, has been named a member of the Council of the Twelve of the Church of Jesus Christ of Latter-day Saints. He succeeds the late Dr. John A. Widtsoe. Before joining UP&L as personnel director, Dr. Bennion was active in church work, including service as church commissioner of education for nine years. During his service with UP&L he directed the establishment of several important employee benefit plans and training programs. He plans to leave the power company in the early summer to devote full time to his new duties

Earl Olson, left, Idaho Power Co. sales manager, is chairman of the Idaho "Grassman of the Year," a state-wide contest sponsored by the company, the State Chamber of Commerce and other groups. Contest secretary is Paul Nash, right, of the Chamber. Idaho Power sponsors the event as part of its community service work. Prizes of $250, $150 and $100 are awarded ranchers who have done outstanding jobs in developing grasslands on their farms. They are selected for land and how it is used, types of grasses and how managed, livestock, and the operator's showing as a community leader

Employees serving Square D Co. for more than 25 years are pictured at their recent Old-Timers dinner at the Nikabob Restaurant in Los Angeles. They are from left to right: George Stover, William Powell, Lawrence Dauphine, Ernest Miller, J. H. Pengilly, the executive vice-president, Harold Duval, Vernon Brown and Charles Neely

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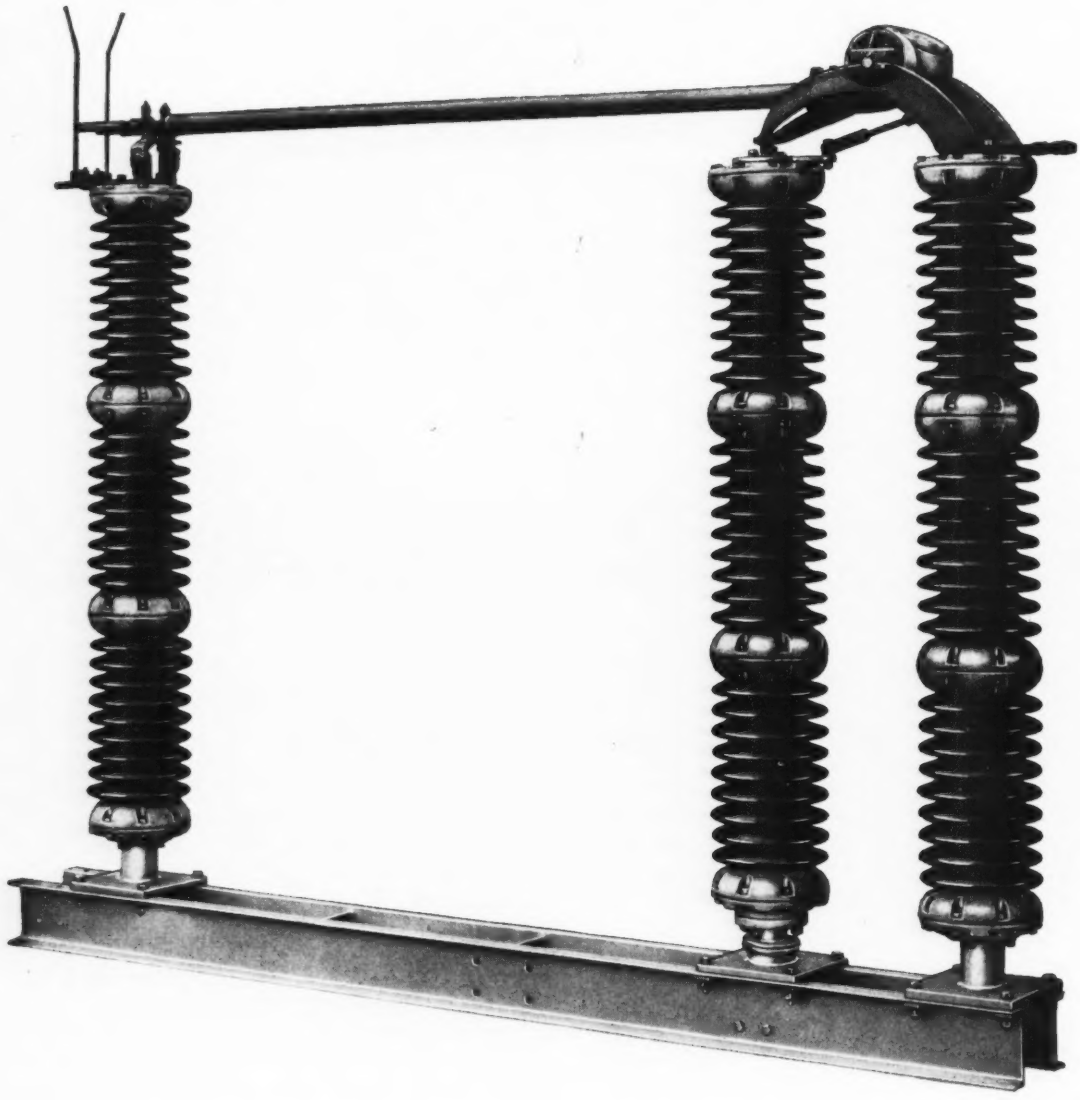

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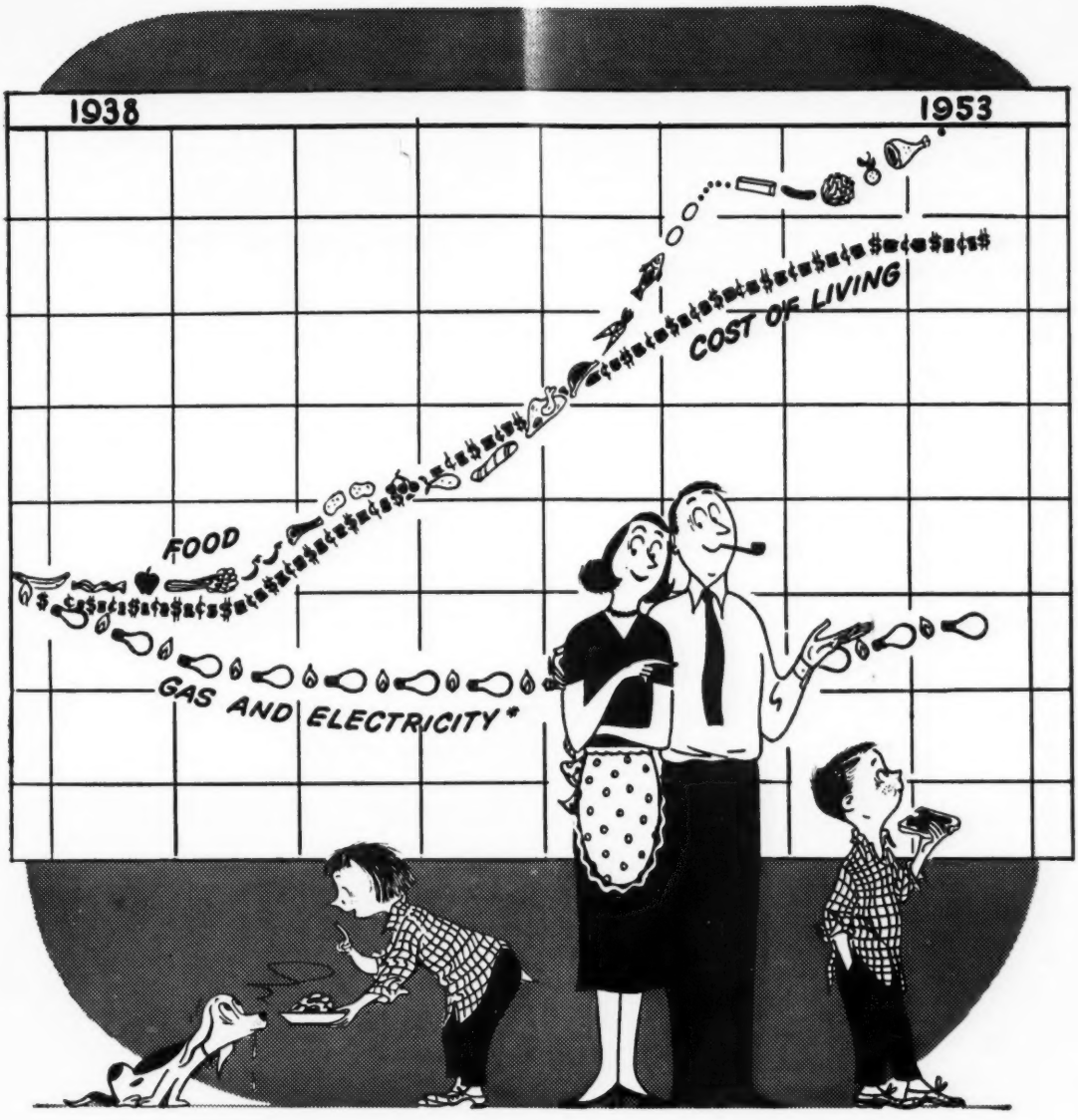

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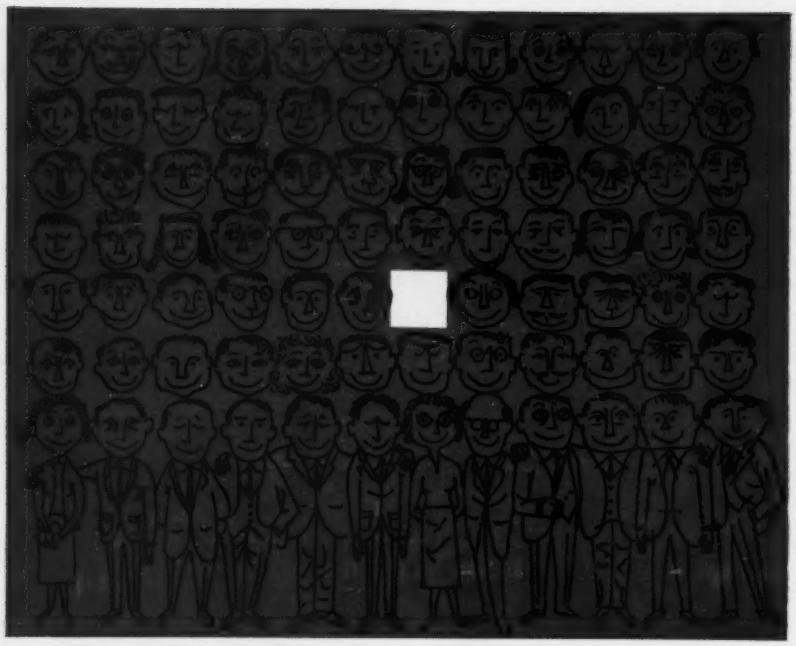

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